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VOL. X. No. 8. AUGUST, 1917 ANNUAL SUBSCRIPTION, $2.00

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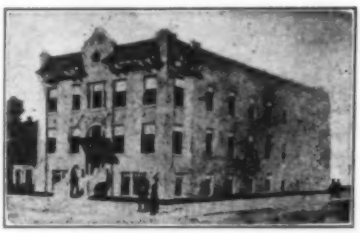

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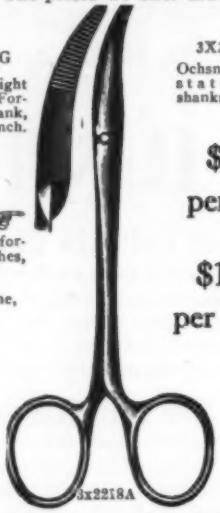

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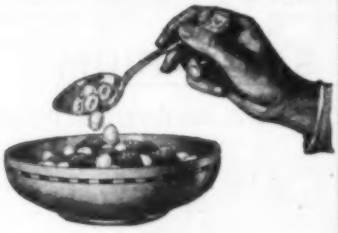

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THE JOURNAL of the Oklahoma State Medical Association

VOLUME X MUSKOGEE, OKLA., AUGUST, 1917 NUMBER 8

INTRAVENOUS MEDICATION.*

W. FOREST M. D., Tulsa, Okla.

Intravenous medication is not the most common method of introducing drugs into the human organism. This is true for several reasons. First, it is a comparitively new prodecure. Second, an inability to prepare the oragnism for such medication. Third, there is no established dosage and method of preparing drugs for intravenous medication.

Intravenous medication is superior to the oral, rectal, cutaneous, subcutaneous, and intramuscular methods of administration.

Medicines administered by the mouth are modified by the secretions of the mouth, stomach, and intestinal tract. The rectal or cutaneous method meets with the resisting substances of their respective locations. Drugs administered subcutaneously or intramuscularly are modified greatly before being taken into the circulation. It, therefore, remains that properly modified and therapeutically applied intravenous medication is the best means of reaching the diseased organism.

Medicines introduced intravenously should be isotonic, or modified, that they will be received into the circulation without any marked reaction, or without disturbing the constructive elements of the blood.

A therapeutic agent, to be directly effective upon the economy of the human organism, must of necessity act through or in conjunction with the hormones. The blood and nervous system are enabled, by this means, to maintain an intimate working relationship. It is, therefore, fair to infer that any abnormality of the blood affects the whole organism, or that any disease of any particular organ can in turn affect the blood.

It is paramount that one should be conversant with morphological, biological, physical-chemical, and bacteriological-parasitological, serological methods, to be efficient in diagnosis, and intravenous medication. Strict attention to the total amount of blood, to hemolysis, to coagulation and thrombosis, and to fermentative activities of the blood is absolutely necessary. A knowledge of infections, immunity, and anaphylaxis is imperative in intravenous medication. Thus fortified we can approach typhoid, luetic, malarial and like conditions with impunity.

A knowledge of the physical and chemical properties of the blood should be ascertained before intravenous medication is attempted. The process of coagulation and the coagulation time are quite important. The phenomenon of thrombin, or thrombase, which converts fibrinogen into insoluble fibrin is equally so; also

*Read in Medical Section, Medicine Park, May 9, 1917.

the relation of the ferment thrombin to thrombogen and thrombokinase. Ionized lime salts must be present to convert fibrinogen into fibrin. Should it be desired to reduce or prevent coagulation of the blood, sodium citrate or potassium oxalate can be added. Solutions of pepton, or hiruden, added to the blood will hinder coagulation.

To shorten the coagulation time, gelatin injections, sodium chloride, calcium lactate, serum injections have been used. It is necessary to shorten the coagulation time in hemorrhagic diathesis, aneurysm, and in internal hemorrhage. In some clinical cases it is salutary to inhibit coagulation which may be done by venesection and intravenous use of patassium citrate, or by intravenous use of hypotonic solutions. According to Haldane, the total quantity of blood in the adult body amounts to approximately one-twentieth of the body weight. In the anemias, the amount may be much less. It is well to know the physiological and pathological changes in the total volume of the blood. This holds especially in reference to the volume percentages of the corpuscles and plasma. A reduction of the total volume of blood—oligemia—occurs in the severe hemolytic anemias, in conditions of inanition, and undoubtedly in the pseudo anemias. Tropical and polar anemias come in this class.

An increased volume of blood-plethora, either permanent or transitory, in the human body, is due to excess of cellular, or the serous elements, or to both. A most important factor in this condition is the *specific gravity* of the blood. The specific gravity is usually increased as in polycythemia. Plethora is often found in chlorosis, yet specific gravity does not increase in proportion to the increase of volume of blood. *Hydremia* is a condition of the blood in which the water content deviates from the normal and may be due to an increase in water of the blood, or from a decrease in the proteins. This condition causes a reduction in the specific gravity. This affection, as in some of the nephropathies, is often associated with plethora.

In the various hydremias and anhydremias, the water content should be carefully studied, for it is of the utmost importance in treatment of various dyscrasias. It should be borne in mind that blood undergoes temporary dilution after abundant water drinking, or saline infusions, but is quickly returned to a normal condition by diuresis or by absorption of the water by the tissues. The blood may become temporarily concentrated by sweating, or by diminished intake of water. Vasomotor changes, blood-pressure variations, alter the water content of the blood. These variations, as for example, exemplified by adrenalin injections, nitroglycerin, atropin, and other vasodilators and vasoconstrictors should be even a matter of close study.

In pathological conditions such as are found in cancer of the esophagus, or pyloric stenosis, the water intake is interfered with and the water-content of the blood is much lessened. It is also lessened when great amounts of water are lost owing to diarrheas of such diseases as Asiatic cholera, cholera nostras, or severe purgation. The water-content of the blood is often diminished by disease of the glomeruli of the kidney. In hydremias the protein content and water-content should be carefully noted. A true cligemia is the result when they diminish equally.

After severe hemorrhages or too large venesection the tissues are depleted of water which tends to restore total quantity of blood.

The regeneration of the protein is not so rapid, but is gradually established. In chlorosis where the water-content shows normal values and increased protein or in pernicious anemia with increased water-content and low protein values, much care must be exercised in selection of dosage and treatment. The same care should be exercised in hydremia occurring in nephropathies and in hydremia occurring in cariopathies with failing compensation.

A knowledge of many factors relative to vascular changes, water retention, retention of electrolytes, and changes in absorptive powers of colloids, should always be prerequisite to intravenous medication. A decrease in the liquid con-

stituents of the blood-anhydremia, causes a concentration of the proteins. This condition always means depravity on the part of the organism. The color of the blood is at once indicative of its condition as regards hemoglobin and blood gases. In health the amount of hemoglobin in the normal adult is about 13.5 gr., in 100 cc.

The experimental work on gases of the blood has been mostly on animals. In animals the arterial blood contains about 22 per cent by volume of oxygen; the venous blood 15 per cent of 0.2 by volume. The amount of hemoglobin cannot be determined by the pallor of the mucous membranes, or by the color of the skin. The tension of the gases appear to be of more importance than the actual quantity from a biological standpoint for the tension may be independent of quantity. For instance, the greater the degree of acidosis the higher the CO_2 tension when the quantity of the CO_2 continues the same. Alterations in the blood gases gives a factor in the cause of dyspnea. This is evident in the dyspnea of anemic patients where there is diminished oxygen content of the blood. In this case it goes parallel with reduction of hemoglobin.

The dyspnea of open pneumothorax, or high altitudes, is due to the stimulation of the respiratory center from attenuated oxygen in the arterial blood.

In cardiac dyspnea there is an excess of CO_2 in the blood; and cyanosis likewise due to the high CO_2 content or lack of oxygen. Setschenow asserts that, in asphyxia, the oxygen-content of the blood diminishes rapidly while the CO_2 rises in like manner. In the dangerous condition of carbon monoxide poisoning, the oxygen is hindered from uniting with the hemoglobin, and thus the oxygen content of the blood decreases. In prussic acid poisoning, there is excess of oxygen in the blood, and a diminution of CO_2 due to loss of the power of the tissues to take up the oxygen from the blood.

The *reaction of the blood is essentially alkaline*, yet from the point of physical chemistry the actual reaction of normal blood is almost neutral. VonJaksch states that the titratable alkalescense of the blood is diminished in fever though the alteration is not permanent. Further, he asserts that concentration of the blood, as in chloremia, the alkalinty is increased. The alkali tension is diminished in uremia.

The *specific gravity of the blood in health is approximately* 1.055. In pathological conditions it may vary from great concentration (1.080) to great dilution (1.030). The specific gravity of the blood serum (1.030) depends mainly upon its protein-content.

The freezing point of the blood (-0.56_0 C) determined by cryoscopy, depends mostly upon the salts in the blood. The normal amount of sodium chlorid is about 0.7 per cent. CO_2 affects the freezing point of the blood, as in cyanosis of emphysema, or myocardial insufficiency.

In intravenous medication the osmotic, thermal, mechanical, and hemolytic resistance of the red blood corpuscles should ever be a matter of study. This is materially true in the treatment of the anemias, hemolytic icterus, and in transfusions. A very great deal of attention should be given the iso-agglutinins and the iso-hemolysins (W. L. Moss).

The viscosity of the blood is one of the most important subjects to be considered in intravenous medication. Increased viscosity, increased toxic condition of the blood, together with insufficiency of the emunctories, produce many of the so-called anaphylactic conditions, after intravenous medication.

It is a subject that very little attention has been given until a comparatively recent date. It is one of the most important subjects, because of the many factors that enter into the etiology. O. Naegeli has given much information on the viscosity of the blood. His investigations have made it possible for a study of the viscosity to be of great clinical value. Any deviation of the viscosity from the normal indicates that there exists an abnormal blood. The viscosity of the blood, in normal adults, averages 5.1. In anemias, the viscosity of the whole blood is

decreased. It is increased in polycythemias. The viscosity of the blood is increased as the CO_2 content is increased. C. R. Austrian has found that the number of red-cells, the amount of hemoglobin, and the quantity of blood-gases, the amount of protein, fats and salts, influence the viscosity. His studies show reduced viscosity in cases of anemia, increased in cases of diabetes, pneumonia, jaundice and polycythemia.

Naegeli asserts that the viscosity of the blood depends upon the following factors: 1. Viscosity of the plasma or serum. 2. Number and volume of red corpuscles. 3. Hemoglobin. 4. Marked leukocytosis on the number and volume of the white cells. 5. The size and volume of the circulating cells. 6. Nature of the cells as regards amount of hemoglobin and water-content. 7. CO_2 of the blood. 8. Salts of the plasma.

A systematic study of the chemical composition of the blood should deal with the whole blood, the blood plasma, the blood serum, and the formed elements of the blood. The total solids of the blood amounts to about 22 per cent by weight. The amount of water in the plasma is approximately 90 per cent. The total protein-content of the blood serum which is about 8 per cent, corresponds to nearly 1.3 per cent of the total nitrogen. In the edema of nephritis it may fall to 5 per cent. The fibrinogen-content (0.4 per cent) a globulin forms fibrin during coagulation. It increases in quantity in pneumonia, in suppurations, polyarthritis, and in some experimental infections.

A decrease is observed in typhoid fever, malaria, smallpox, measles, in conditions of inanition, in severe anemias, in leukemia, and in Basedow's disease. It has been assumed by some authors that fibrinogen is found in the bone marrow, while others (Whipple, Goodpasture) believe that the liver is greatest source of fibrinogen.

In health, the fibrinogen content of the blood regenerates very rapidly (Goodpasture). It is reproduced in the body in required amounts and is of vital importance to the organism. In phosphorus, chloroform, and like poisons the liver may be so affected that the fibrinogen is greatly diminished. Hence, the occurrence of ecchymoses and internal hemorrhages in these instances.

The examination which reveals a low fibrinogen content is helpful in the diagnosis of acute yellow atrophy of the liver, cirrhosis of the liver, and also gives a very good foundation for a prognosis. Howell maintains that the hemorrhages of hemophilia are not due to lack of fibrinogen, but to a lowering of the prothrombin-content of the blood plasma.

The rest-nitrogen which is about 5-10 per cent of the total nitrogen of the blood plasma in normal cases, is markedly changed in pathological conditions as in uremia. It is the nitrogen of hippuric acid, uric acid, proteinic acids urea, and the amino acids. The amount varies greatly in normal cases. It is diminished during a fast. On a diet mainly of meat it is markedly increased. Nephropathic cases furnish the highest values. In uremia 0.336 per cent of rest hydrogen has been observed (Strauss).

Fats and lipoid substances in the blood deserve to be carefully analyzed. Among their several constituents lecithin, jicorin, and neutral fat are found. Free-cholestrin can be isolated from the blood. Under normal conditions the fat-content of the blood may vary greatly, according to the intake of fat with food.

Fasting diminishes the fat-content of the blood. Lipemia is found in various pathological conditions in diabetes mellitus, with acidosis. It is also found in obesity, pregnancy, chronic alcoholism and phosporous poisoning. Carbohydrates occur in the blood as free glucose, and "virtual" sugar of Lepine, glycuronic acid, fructose, and animal gum. The normal sugar-content of the blood is approximately 0.1 per cent. Hyperglycemia is met with in diabetes mellitus, and temporarily in other conditions.

The extractive substances of the blood are divided into two classes: Nitrogenous and non-nitrogenous.

Among the nitrogenous are urea, uric acid, carboninic acid, kreatin, hypoxanthin, the amino acids, and the proteinic acids. The normal urea-content of the blood is about 0.1 to 0.2 per cent; but increased during digestion. Urea is increased in the nephropathies. No relation can be found between the amount of urea and uremic conditions.

Increased proteolysis in the body means increased urea-content of the blood. Urea-content of the blood and urine is decreased in hepatic insufficiency. The amino acids seem to replace the urea in this condition. The normal uric-acid content of the blood is about one milligram in 100 cc. (Magnus Levey). Weintrand asserts that a meal rich in purins may increase the amount of uric acid to 5 milligrams per 100 cc. Uriacidemia, and increase of uric-acid in the blood, is always found in gout. It is also found whenever many cell nuclei are undergoing degeneration, as in resolving pneumonia, leukemia, or X-ray therapy of the spleen. Our present knowledge of amino acids is limited.

The non-nitrogenous extraction such as lactic acid, acetone ethyl-alcohols and oxybutyric acid, indol, indoxyl, skatol, and lipochromes must be kept in mind in diagnostic methods.

Of all the inorganic salts of the blood to be studied for clinical purposes, sodium choride is the most important. This study is made from analysis of the ashed blood. The iron content of the blood depends solely upon the hemoglobin.

The ferments of the blood, at the present time, are receiving a great deal of attention. The carbohydrate-splitting ferments, oxidases, and catalases are the more important. The catalases are of much prognostic and diagnostic value and as such have been much used by Winternitz and Meloy. It has been observed that catalase activity is diminished in the renal insufficiency of pregnancy, lobar pneumonia, late in typhoid conditions in prostatic hypertrophy, causing urinary obstruction, in hypothyroidism, and in uremic states. Catalase activity is increased in hyperthyroidism. In diabetes mellitus, well compensating nephropathies, and in the cardiopathies no marked change is observed. Abderhaldens reaction for the early diagnosis of pregnancy appears to be of real value, and it is entirely possible for it to be of assistance in the diagnosis of other diseases of the body.

The importance of a thorough knowledge of the diseases of the blood and of the blood building organs has been fully emphasized in another part of this paper (vide supra). It is fitting at this point to again call attention to the necessity of a study of the regeneration of the red blood-corpuscles, with special reference to the bone marrow. The white blood-corpuscles play, in my opinion, the most important role in the economy of the human body. The multiplicity of places of origin and complexity of their function confronts the investigator with one of the most profound problems in the study of disease. Most authorities agree that, in adults, the white blood-cells are derived from the bone marrow, partly from the spleen, lymph glands, and other lymph-adenoid tissue of the body.

The regeneration of the white blood-corpuscles is no doubt brought about by a hormone. This hormone is the product of stimulation of the affected organ, or organism or both.

The number of white cells vary a great deal, daily, under normal conditions. There is an increase in the number of leukocytes after each meal. In some pathogenic infections there is an increase in the number of leukocytes in the blood, in others the number of leukocytes are decreased as in typhoid.

The birthplace of the blood platelets appears to be in the bone marrow giant cells. That is, during the evolution of the cell, minute portions of the protoplasm are pinched off to form blood plateletes.

It is not within the scope of this paper to discuss the more important methods of examining the blood. These methods and the knowledge to be obtained therefrom should be familiar to every internist.

The details to be observed in intravenous medication relative to operative

site, preparation of the patient, and operative technique are much the same as in intravenous infusion.

The method used by the author differs very little from that in general use. The median basilic, or accessory veins, in and about the bend of the elbow, and the internal saphenous just above the ankle, are the veins most commonly used. The vein is made to fill by pressure on the proximal portion. The skin is made tense and the needle passed gently into the lumen of the vein and pressure removed. Strict aseptic precautions should be observed at all times.

The technic should be thoroughly mastered. Among the serious dangers are undue pain, air embolism, infection, or death.

A thorough knowledge of the drug to be given is one of the pre-requisites of intravenous therapy. The patient should be tested for any idiosyncrasy that might arise. All drugs to be used should be made isotonic. In fact each ion of drug should correspond in resistance to that of the blood. Thus in the administration of 10000 units of diphtheric antitoxin, there is a corresponding toxic resistance, and its activity shall have expended itself in 6 to 10 hours. Mercurialized serum (5.5 mg. mercuric chloride in 8 mills normal serum), salvarsanized serum, and quinine in serum should be measured in like manner.

It is not advisable for the tyro with present methods, to use nitrites, iodids, iron, or salicylates intravenously.

Polypharmacy has no place in intravenous medication. Drugs must be used in proportion to the results desired; some may be used in large doses while others in small and frequently repeated doses.

In an epitomized recapitulation, I would suggest especial attention to the following outline: 1. Diagnosis, correct, absolutely imperative. 2. Individualistic tendencies. 3. Condition of emunctories; functionating power. 4. Central and sympathetic nervous system. 5. Heart and arterial system. 6. Gases and body fluids. 7. Chemical and physiological action of the therapeutic agent to be used. 8. Purity of the agent and therapeutic accuracy of dosage. 9. Preparation of patient. 10. Technic, and post-operative treatment.

FURUNCLE.

W. Bartlett, St. Louis (*Journal A. M. A.*, June 23, 1917), offers the following treatment for solitary furuncle, a condition in which he says, trauma always plays a definite role in its incipiency and this is the reason why it is more frequent in males than in females. On the first appearance of symptoms the lesions should be protected with a bunion plaster or vaccination shield, and not be picked or touched with the fingers or exposed to injury from rubbing. It should be exposed to the sunlight or incandescent electric light as much as possible and acetylsalicylic acid in doses from 5 to 10 grams is useful in limiting spontaneous pain at this stage. If the boil is not aborted by these measures, one should wait till a definite pustule has developed; then infiltrate a definite ring of 0.5 per cent novocain in the surrounding healthy tissue, adding four drops of 1:1,000 epinephrin solution to the solution used, and after pain has been completely stilled the boil should be opened widely by a crucial incision made with a very thin platinum electrocautery blade. If sufficient time has elapsed to ripen, the core can be lifted out at once, but if not, gentle suction should be employed every hour or so with a suction apparatus, the wound being merely covered with a vaccination shield and exposed to an incandescent light. If the lesion is on the back of the neck and any kind of circular bandage used, painful pressure and massage of the wound are unavoidable and it may be further said that any form of dressing makes a pus poultice and accounts for many infections and secondary boils. This treatment can be carried out by any intelligent person and if carefully done will cause great relief. Bier's suction rapidly reduces the edema in adjacent muscles and relieves the disagreeable stiffness of the neck.

THE PREVENTION OF MALARIA.*

DR. JOHN W. DUKE, State Commissioner of Health.

The problem of malaria is one of the most important, yet in some ways one of the most difficult, presented to the modern physician and health officer. Malaria cannot strictly be termed a dangerous disease in itself—that is, the direct death rate from it is small. From the strictly medical and clinical viewpoint it does not present the puzzling and baffling features of some other diseases. The active factors in the disease are perfectly well known; there is no doubt about the methods of treatment, although, of course, in this as in other lines medical science is continually advancing, which means to a certain degree changing. The main difficulty in dealing with malaria does not lie along any of these lines. It is largely due to the fact that the problem is a sociological and economic one, in addition to a strictly medical one. Given authority and funds, the State Board of Health could practically eliminate malaria in almost any district; but to reach this end, not only individual, but community interest and efficiency is needed. And every health officer has found through bitter experience that community action is something which we desire many, many more times than we attain.

Despite these difficulties, the malaria problem is not one which can be dodged. It is a problem of import in the South and to a lesser degree in the Southwest. It is a problem of especial interest in Oklahoma, for malaria is a rural, rather than an urban disease, and this is essentially a rural state, we have thriving and progressive cities, but the fundamental interests of Oklahoma are along the agricultural and producing line, rather than along the line of industrial intensity. It is true that malaria is not at all prevalent in this state as a whole. The greater part of the state is free from this disease, but there are certain sections in which it not only prevails, but prevails with an intensity which is a marked factor in diminishing both efficiency and human happiness.

In fact one of the most, probably the most essential factor in attacking the problem of malaria is educational work, both as concerns the individual and the community. The individual must be aroused to the precautions which he can take against malaria, the direct and practical means he can employ to protect himself and his family against malarial mosquito. But the most careful and conscientious effort on the part of a single individual may be to a large extent nullified by carelessness or indifference on the part of a neighbor. Therefore it is equally necessary that the community be aroused to action. Some of the most effective work in the prevention of malaria has been done under government supervision. But such supervision is scarcely possible in this country unless the people concerned are alive to the advantages of it. This can be reached by educational work on the part of physicians and health authorities. There is no other way. There is much encouragement, however, when the results which have been actually accomplished where proper measures have been used are considered. Under Roman rule the Italian Campagna was one of the garden spots of the world. It was dotted with flourishing cities, thriving towns and beautiful villas. Following the sack of Rome, many of the aqueducts were broken, the drainage canals filled up, the land was only partly cultivated. It gradually became one of the most unhealthful spots in the world. Some years ago the Italian government took up in earnest the problem of eliminating malaria from this district. Now the disease is almost unknown. Under even more adverse conditions a considerable measure of success was won by the German government in German East Africa and more would have been accomplished had not the great war intervened. Malaria was one of the most prevalent diseases in the Federated Malay States. Educational work among the natives of either East Africa or the Malay States was obviously impossible. On the other hand, the German government in the one case, and the British in the other, had a free hand. They were able to institute preventive

*Read before the Oklahoma State Medical Association, Medical Section Medicine Park, May 9, 1917.

measures on a wide scale. Great results were accomplished in the Federated States. There are a number of sections of the United States in which much the same work has been accomplished. And in no part of the world has there been a greater success won than in the Panama Canal Zone under the direction of Surgeon General W. C. Gorgas, of the United States Army. The experiments and investigations made under his direction constitute one of the most valuable chapters in the fight against malaria.

There is a special factor which has operated largely in recent years which will tend to grow more and more important which makes the malaria problem one of great moment to the South and Southwest. These sections of the country are being largely developed from an industrial viewpoint. To a large extent this development is dependent upon the production of hydro-electric power. Huge plants of this sort have been constructed in many of our states and they will tend to increase. That this development is to the economic and industrial advantage of the states in question is admitted. But like many other developments, it is likely to bring with it certain bad results. This does not, and should not, mean that we should forego the development, but it should mean that we will take steps to prevent the undesirable and not absolutely necessary results.

For the production of this hydro-electric power the construction of large dams and the consequent creation of ponds of considerable size is necessary. These bodies of water in many cases have become breeding places for the anopheles mosquito and consequently a cause later for a marked increase in malaria in the adjacent districts. Surveys have been made in a number of places with the view of accurately determining and ultimately correcting these conditions. Progress has been made, but there still is much to be done.

Prevention of Malaria.

Like many of life's evils, the problem of the prevention of malaria is not so much to know what to do as to get people to do it. It is perfectly well known that the origin of malaria is with the bite of the anopheles mosquito. Obviously the way to avert the disease is, first, protection against the bite of this mosquito, and, second, the prevention of the breeding of the mosquito. In order to have malaria, you have got to have human beings, female mosquitoes of the anopheles variety, and malaria microbes. As is well known, the mosquito does not itself generate the microbe poison causing the disease; she first bites some person having the malarial microbe in his blood, later biting another person and thus conveying the infection.

There is no question as to the great part played by what might be termed human carriers in indirectly extending the spread of malaria. These persons do not exhibit symptoms of malaria. Nevertheless the malaria microbes are present in their blood. When these microbes are transmitted by the bite of the anopheles mosquito to another person an attack may follow. It is pretty well established that the way in which the malaria germs survive the cold of winter is in the blood of infected persons, rather than in hibernating mosquitoes. A somewhat extensive investigation of this phase of the malaria problem was made only a short time ago under the direction of the United States Public Health Service. In certain districts of Mississippi, where malaria is prevalent, examination was made of the blood of 1,184 apparently healthy persons. It was found that 492 carried malaria germs in their blood during the winter. Hibernating mosquitoes to the number of 1,211 were examined and found to be entirely free from malaria germs. In fact no infected mosquitoes were found until May, when they were discovered in the homes of known malaria carriers.

The Bureau of Entomology, of the United States Department of Agriculture, has for some time been carrying on investigations into the causation and prevention of malaria, especially with reference to the effect on rural industries. Dr. Van Dine of that Bureau says: "The prevention of malaria and the treatment of

the disease are two distinct problems. The former is biological in scope, while the latter is a medical problem. The treatment of the disease over long periods in malarial regions has not reduced the malarial rate in those regions except where prophylactic measures have been employed for protection from attack by the malarial mosquitoes, or measures taken to reduce the malarial mosquitoes in numbers. The disease is well understood and treated by the physicians. The physician also urges his patients to screen their dwellings, to use bars against the adult mosquitoes and to prevent the breeding of mosquitoes in and around their properties. Here the responsibility of the physician ceases. The fact that malaria continues, then, is not due to the treatment of the disease, but to lack of control of the mosquitoes that convey it. The present efforts of malarial prevention in this country are based on insufficient data concerning the biology of the mosquitoes that transmit the disease. Practicing physicians in rural districts are free to admit that while they can administer the treatment for malaria successfully, they cannot advise definite preventive measures that meet in a practical manner the peculiar conditions which confront them in their particular zones of practice. It is a fact that prophylactic measures are too general to be standardized. Malaria is a rural disease, but its relation to agriculture and to agricultural development are not known."

One of the most puzzling and difficult features in attempting to fight malaria is the question of dealing with human carriers. At a conference of the Southern Medical Association which was largely devoted to consideration of malaria, Dr. C. C. Bass, of New Orleans, said in regard to this phase of the problem: "With regard to malaria carriers, or men carrying malaria over from season to season, and whether hibernating mosquitoes carry it over from season to season, that question must and will be worked out in the future. Man must be a very important factor in carrying the disease over from year to year, and therefore disinfection of man during the winter would lead to valuable results. If we can destroy the malaria plasmodium in man, or in hibernating mosquitoes, the results would warrant our doing so. We know that a large per cent of men carry malaria over between seasons. We know also, and I think that it is generally accepted to be a fact, that comparatively only a small per cent of mosquitoes are able to live and hibernate during the winter. In the spring we have not very many that have succeeded in going through the hibernating period. Presuming a number of them may be able to carry malaria with them, we would have a small source of infection. The great source of infection, or the carrying of malaria over from season to season, and perpetuating the disease is man and not mosquitoes; and the destruction of the organism must be attacked largely at least in man. The immunity that results from a previous attack of malaria is a very important factor in producing these malaria carriers, or persons capable of being malarial carriers.

"Let us compare this disease with Texas fever or cattle tick fever, a disease of cattle caused by an organism similar to the plasmodium of malaria. It lives in the red blood cells of the animal and reproduces in a similar manner; and an animal, if inoculated, or infected during the early months of its life, acquires a certain amount of immunity. It may be reinfected by ticks and live without developing the destructive form of the disease. If it escapes immunization during the early period of its life, it is very susceptible to the disease and a large per cent of those infected die. An immunized cow is capable of being infected and transmits infection as long as it lives in an infected area of the country and is continually reinfected, but it does not develop the severe form of the disease itself. We can take the blood of such an animal and inoculate it either directly into a susceptible animal, or indirectly from ticks and transmit the disease, but if we transfer the animal for a number of months to a non-tick pasture, then it loses its capacity to infect and retains its immunity during life. It is probable that the same thing occurs to a great extent in man. It can hardly be questioned that there is a considerable amount of immunity acquired by men who have been born and raised in a malarial section. They are still capable of being malaria carriers as long as

they are repeatedly reinfected by infected mosquitoes; that a number of such persons, sick perhaps only once in a while, and many others not sick, are a constant source of reinfection for one another and to others, and that is how the disease persists.

"Disinfection of such individuals would be a matter of extreme importance, and if we educate people to disinfect themselves when they have malaria, we would not have to fight mosquitoes to prevent the disease. Not only does it require the anopheles mosquito, but it requires malaria to transmit malaria from man to man. It matters not how many mosquitoes were present, if we did not have malaria we could not have malaria transmitted. It is important that in connection with any drainage project and education against mosquitoes we should also teach our people how to cure malaria and how to prevent it. The screening of houses and draining of land will cost a lot of money but quinine costs comparatively little. I simply want to emphasize the importance of disinfection of malaria carriers. It is probably of paramount importance for early results."

While the importance of quinine and other means of disinfecting carriers should be realized, it must not be overlooked that although these carriers may be the primary cause for the disease it cannot spread with the intermediary cause, that is the anopheles mosquito. From the immediate and practical viewpoint, therefore, precaution against these mosquitoes, methods of preventing their breeding must be considered. As a matter of fact there are many districts in the United States as well as in other countries where once malaria was prevalent and where it is now comparatively rare. It was not by the disinfection of carriers that this improvement was brought about. In general it was by measures which tended to prevent the breeding of anopheles mosquitoes. There are large areas in the Middle West states and along the Mississippi River where a few years ago "chills and fever" were accepted almost as something which was ordained and could not be avoided. Many of these districts are today comparatively healthful. Often this change has been accomplished simply through the progress of settlement and increase in population, rather than with any intent to do away with malaria, but the result has none the less been attained. Swamps and ponds have been drained, stagnant streams cleared out, other improvements made. Gradually, almost imperceptibly, the malaria disappeared.

The great objection to the drainage of large districts is the expense involved. Often it has been found that good results were accomplished at smaller expense by the spreading of a small film of oil over the surface of the water, thus preventing the anopheles larvas from coming to maturity. In streams where there is a current the clearing away of weeds and grasses along the banks will often accomplish excellent results. Gold fish and many other varieties of small fish are active and persistent enemies of the larvas. It must be remembered that the same floatage which affords a resting place for the larvas is also likely to prevent the fish from reaching them and ponds and streams should be kept clear of it. In many places wave action will prevent the breeding of mosquitoes, but there are likely to be sheltered areas which are not affected. One of the most important precautions is not to permit water to stand in barrels, empty tins, etc. As far as possible small pools and similar bodies of water should be drained. Often the receding of water after heavy rains or freshets leaves little pools, which are fertile breeding places. While mosquitoes breed in the water they shelter themselves during the day when the sun is up in weeds and bushes. As far as possible these should be cut down, especially in the vicinity of dwelling houses. It is self-evident that to be effective these measures must be carried out on a more or less large scale, thus emphasizing the necessity for community action. It is obvious that if one farmer is careful to prevent mosquito-breeding conditions, while his neighbors take no heed, little will be accomplished. Nevertheless a start must be made and if an individual does his own part he not only helps directly but his example may have an excellent effect.

For the protection of human beings while in houses, good screens are the best

measure. Care must be taken, however, that the screen is not only strong and unbroken, but that it is small enough. Otherwise it may have the effect of keeping the mosquitoes imprisoned within the house, for sometimes a hungry mosquito can creep through a too large screen but cannot get out after feasting on his, or rather her, victims. The voracious mosquitoes which are such a pest during the daytime are not dangerous although sufficiently annoying. The anopheles mosquito is seldom abroad except after dusk, she is shy and most apt to bite when a person is asleep and finally she does not sing much. This last is about the only good thing which can truthfully be said of her.

The State Board of Health is alive to the great importance of eliminating malaria in this state. It can do and is doing much in that direction, but its efforts must be largely educational. It can and does point out to the people the measures which will avail against this disease. But it cannot always insist that these measures be carried out. The State Board of Health cannot make a man drain a pond which may breed mosquitoes, unless it can be positively shown that it is a decided menace to the health of the community. There is room for improvement in our laws and as a matter of fact any official who has ever dealt with practical questions has long ago come to realize that more than the mere legislation is necessary. It is all very well to order a farmer to make certain improvements. If he has not the money to make them the order is difficult to enforce. Especially is it hard to enforce laws in any American community if these laws are not backed by public opinion. Much has been done in the way of educating the public but it is a long, hard road. Only slowly does the average man recognize that sanitary laws and regulations are not oppressive measures but measures which will make himself and his family healthier and happier. In this great work of educating the public the State Board of Health can have no more efficient ally than the physicians of Oklahoma. And it is only their due to state that they have given their co-operation freely and cordially along many lines for the conservation of the public health.

While the task of eliminating malaria from our state is not an easy one, it is a work eminently worth while. For the evil of malaria is not measured by the toll of deaths which it takes. An untimely death is to a certain degree a tragedy but it is not the greatest tragedy for death inevitably must come to all. A greater tragedy is a wasted life, a life which might have amounted to something but did not. And there are tens of thousands of such tragedies due to malaria. It decreases the energy, the efficiency, the health and spirits of its victims. It makes them a burden to themselves and those dear to them, when they should be a help. It beclouds their entire outlook on life. There have been many schools, many creeds, many standards, which have swayed men during the centuries we have slowly fought our way upwards from barbarism, but there is one test and standard which is unfailing and can always be applied, whether to a man's entire life or to the work and effort of a single day. And this test is—is human happiness increased, the misery of men and women and little children decreased by this life or this work? It is a simple test, yet a terrible one for it is founded on the eternal principles of truth and right. Even today across 1500 miles of land and more than twice as many of water we have the spectacle of the greatest military empire men ever founded in the most desperate struggle the world has ever seen. And in our hearts we know that it will lose and must lose because its policies and its principles cannot stand this test. But judged by this test the work of the conscientious physician and health officer will stand, for there is none other which is more directly concerned in the promoting of human well being, the final betterment of mankind.

Discussion.

Dr. Chas. W. Heitzman, Muskogee, Oklahoma: In opening this discussion there remains for me just the emphasizing of some of the many good points that the speaker has incorporated in his paper. For the sake of brevity the "Preven-

tion of Malaria" may be summed up as follows: 1. Treatment of patients. 2. Protection of people living in places where malaria is recognized as endemic. 3. Destruction of germ transmitting insects. 4. Drainage or other special treatment of swampy lands. In the prevention and control of malaria such method should be selected that will be productive of the largest results, with a reasonable expenditure of funds. The malarial index can be reduced 30 per cent if the homes are thoroughly screened. Where it is practicable, as in cities and towns, should always be advocated. However, it costs from $18 to $20 to screen a home and there are many rural homes that would have to be reconstructed in order to screen them properly. This limits screening as a means of protection. Drainage is possible in towns and cities, and in certain communities, but there are vast areas where the immense cost is prohibitive and therefore impracticable, and even where drainage is being effected conditions are left which permit the breeding of mosquitoes. The most feasible plan just now, seems to be the proper use of quinine both as prophylactic and curative, i. e., under average rural conditions. But in conducting an intensive campaign for the disinfection of malaria carriers, there are many problems yet unsolved or at least we should understand them better. We should know the proper dosage of quinine that will disinfect malaria carriers in a reasonable time with least inconvenience, and just when to conduct this campaign. Should it be carried on during the months when there are no mosquitoes? Other questions of equal import and practical importance must also be solved. From the investigations that are now being made along these lines, I believe it will only be a relatively short time when information will be available that can be used in intensive campaigns against this menacing disease. The health conditions of the Southern states are essentially the same, and no general plan will overcome them; we must, in order to be successful, apply our remedies specifically, and intensively to the individual and to the home.

Dr. C. M. Bloss, Okemah: Considered from an economic standpoint, the elimination of malaria is, for many districts of our country, the most important measure which could be applied. The waste of time, money, health and other resources due to this one factor is very great. I live in a malarial district and I am sure there is no single reform which would be more conducive to the happiness, health and general welfare of the people of my county, than that of preventing or eliminating malaria from it.

A few years back, when we had about three dry years in succession, our malaria almost disappeared. Almost immediately upon the advent of a wet spring and summer, the malaria reappeared in all its former severity. Human carriers undoubtedly harbor the disease for years without outward symptoms. Elimination of the disease involves the eradication of the mosquito or the disinfection of the human carrier. The latter method I believe to be the most practical until the people can be educated to see the economic value to be obtained from the expenditure of large amounts of money in drainage projects and other methods of fighting the mosquito. The ordinary method of giving quinine in malaria (that is the method I have most generally used) of giving fifteen to thirty grains on the morning of chill day before the chill time, following it up on several successive chill days, while very effective in stopping the chills, I have found to be very frequently followed by recurrences in a few weeks. Sometime back I began following the suggestions of Dr. Oschner of Chicago in the treatment of such cases and with excellent results, I believe. The treatment consists in, first, thorough elimination by means of a hydragogue cathartic, followed by the giving of two grains of quinine every two hours, night and day, for thirty doses. This is to be given in capsules with the cap off and accompanied by a hot drink. Only a light liquid diet is allowed during the giving of the quinine. Seven days from the beginning of the first course, a second course of thirty two-grain capsules is begun and given in exactly the same manner as the first. Dr. Oschner claims that by careful attention to the giving of quinine in this manner, all the organisms and spores as well

will be killed. I believe I have gotten most excellent results myself from this method in a few cases which continued to recur under my former treatment.

Dr. Duke, closing: In answer to Dr. Bloss regarding the treatment of this disease, I purposely refrained from taking up this feature of the subject, believing that more good could be accomplished by calling your attention to malaria as a sociological factor than could be gained by considering it as a medical problem. The medicinal treatment of this very prevalent disease is so well known that I probably would hardly be justified in taking up your time in calling your attention to what I believe to be a successful treatment for malaria. However, from a prophylactic standpoint, if all individuals who are carriers could be induced to take from two to eight grains of quinine two or three times a week, extending over a period of four to six weeks, beginning in the latter part of March, I am confident that malaria in that community for the next few years would be a negligible problem.

I was born and raised in the Mississippi Yazoo-Delta. I, therefore, flatter myself in the belief that I have considerable knowledge regarding malaria in all its phases, both as a layman and as a professional man. The planters in that country know how to properly treat malaria therapeutically. Quinine is a daily routine as a prophylactic measure. When some member of the family, or some tenant on the plantation, is stricken down by a malarial attack he is as often seen by the master of the plantation as by a doctor, both of whom invariably order abstemious diet, liberal hydrogogue cathartics, and the administration of quinine every two hours without missing a dose, for at least thirty-six hours. This is the one, two and three day attacks. In order to catch the spores which develop into malarial plasmodia about the seventh day, quinine is given on the sixth day, two doses every two hours for about twenty-five doses, which is repeated again on the thirteenth day, and the twenty-first day, when it is concluded that the malarial for that season has been broken for that particular individual, and the conclusion is ninety-nine times in a hundred correct.

I am sure that no malarial mosquito could live in the temperature of this pavilion this morning, and I have not been able to observe a very great activity of the heat bacillus in our midst. I am, therefore, not going to detain you longer.

PARAFFIN FOR BURNS.

Torald Sollmann, Cleveland (*Journal A. M. A.*, June 23, 1917), after mentioning the main drawback of the paraffin method in the inconvenience of melting the paraffin and keeping it melted at the proper temperature between 55 and 60 C., reports his results with two devices, an electric "food warmer" for office use and an "acetate thermostat" for shop and field practice. The food warmer is the pint size sold for the warming of babies' milk bottles. When filled one half or two thirds with paraffin of melting point 47.5 C., it can be used in three minutes after the current is turned on. If the current is then turned off again for two minutes, it will have just the right temperature and will remain usually melted for ten minutes without current, when a crust begins to form; and it can then again be made usable by turning on the current for a few moments. He gives a table showing the data of an actual experiment. The next device, the acetate thermostat, is based on the principle of the property of sodium acetate to melt and congeal at just about the temperature that is needed and maintaining it constant for a long time while passing from the solid to the liqiud state. The author gives a table showing the cooling of sodium acetate which holds its temperature for three hours after removal from the heat; this period could be prolonged by setting it in another pot. Sodium acetate is sirupy, not easily spilled. It does not evaporate so that no attention is required in this direction. The apparatus that Sollmann is using is an ordinary glue pot, size 0, the outer pot filled two thirds with the acetate and the inner vessel holding about a pound of paraffin. This apparatus can be carried to any part of the shop or in an ambulance to a dressing station.

INJURIES OF THE HEAD.*

J. W. RILEY, M. D., Oklahoma City, Okla.

The object of this paper is not to add anything particularly new to this important subject, but to call attention to certain anatomical and physiological conditions and the relation that they bear to brain injuries and their frequent effects.

The dura matter of the brain covers the interior skull and extends through the various foramina of the skull as an outer covering for the various nerves at these exits. This is especially noticeable around the optic nerve and accounts for the dilated veins and the choked disc that appears as a result of intra-cranial tension.

The dura is composed of two layers: 1. An outer tough fibrous layer that forms an endostium for the cranial bones. 2. An inner more delicate endothelial layer. This layer separates to form the sinuses of the brain, the falx cerebral, falx cerebelli and the tentorium. The dura receives its nerve supply from the fifth cranial nerve and is extremely sensitive to pressure.

The arachnoid lies over the surface of the brain while the pia dips down into the sulci and covers the surface of the convolutions. This arrangement has been compared to a mitten pulled over a gloved hand. The mitten and glove represent the arachnoid and pia respectively.

The blood supply to the surface of the brain has a very free anastomosis, while that to the basal ganglia is terminal. These vessels arise at right angles and this plays an important part in the reduction of intra-vascular pressure and flow. As far as is known these vessels have few if any vaso-motor nerves, and intra-cranial pressure is dependent on gravity and the controlling influences of the vaso-motor center on the systemic circulation. The veins are large, thin walled, and very responsive to compression and distention, they have no valves and many of them are terminal. Softening may occur as readily from them, when obstructed, as from arteries. This is especially noticeable in the vein of Galen.

In case of obstruction to the venus outflow, the posterior condyloid, the diploid and orbital veins act as accessory channels.

In head injuries it has been the custom to consider the symptoms as due to concussion, contusion, laceration and compression. All may appear in the same patient.

Concussion is a clinical condition about which much has been written and apparently very little known. Clinically it has been divided into three varieties or degrees, mild, moderate and severe. At the present time it is generally believed that concussion is a microscopic contusion of the brain. Examination of the brain after death from concussion, has shown extensive injury in many cases.

The commonest sites of contusion and laceration are the regions near the middle fossa and the tips of the temporal and base of the frontal lobes. According to Brun's (Heidelberg statistics) 60 per cent of the deaths in the first 12 hours, following head injuries, are due to contusion. This was most marked in the cerebellum.

In compression of the brain, whether from extra-dural, subdural subarachnoid, or intra-cerebral hemorrhage, depressed bone or resulting oedema, we have a condition that demands the most careful judgment and observation, if we are to prevent the present fearful mortality and post traumatic disabilities.

Sharp reports a mortality in brain injuries, of all cases, from three of the large New York Hospitals, from 1900 to 1910, at 46 to 68 per cent. Besley reports 1000 consecutive cases of fractures of skull, at Cook County Hospital, with a mortality of 53 per cent. Sharp further reports on 34 per cent of cases of head injury, discharged from three of the large New York hospitals 1900-1910.

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*Read before the Section on Surgery, Medicine Park, May 9, 1917.

This shows that 67 per cent of the 34 per cent are still suffering from the effects of the injury. Such as headache, fatigue, vertigo, excitability, irritable, listless, happy-go-lucky, good-for-nothing bums and epileptics. He believes that as a result of the injury there occurs an increased intra-cranial pressure, which prolonged over a long period of time impairs the function and blood supply to the cortical nerve cells. This condition also gives rise to the chronic oedematous brain.

In compression of the brain the determining factors depend on whether the intra-cranial pressure is due to a local or general condition. If due to a local condition, its effect depends on the site, amount and duration of pressure and is greatest at the site, and the systemic effects increase proportionately the nearer it approaches the vital basic centers. If the intra-cranial pressure is general, it involves the entire cerebrum, as is found in extravasation of blood, or serum, meningitis, hydrocephalus and oedema of traumatic or systemic order.

The duration of increased intra-cranial pressure is of much importance. A slowly increasing pressure gives few or no symptoms at first, while a pressure of sudden onset give manifestations at once.

The effects of increased intra-cranial tension depend on the duration of the pressure. Venous stasis and diminution of cerebrospinal fluid are seen early, and later when the pressure equals that in the capillaries and veins there results cerebral anaemia and loss of function of the brain. In the medullary centers this gives rise to stimulation of the vaso-motor centers and increase of blood pressure (Cushing). The increase of blood pressure tends to relieve the anaemia of the brain for the time at least, and there is a tendency to repeat itself. The progressive rise of blood pressure is due to constriction of the splanchnic field and when the pressure is flunctating it gives rise to Cheyne-Stokes respiration (Cushing).

If the cerebral pressure continues to increase, then the arterial pressure finally fails to respond, medullary oedema occurs, the respiratory centers fail and finally the heart ceases to beat. According to Archibald in the *American Practice of Surgery*, there must be a displacement of a least 6 per cent of the brain mass before signs of general pressure exists.

The results of anaemia of the medullary centers are: 1. High blood pressure from stimulation of the vaso-motor centers. 2. Slowed pulse from stimulation of the vagal centers. 3. Cheyne-Stokes respiration from flunctating levels of raised arterial pressure.

The various phases have been classified by Cushing as follows:

1. Stage of compensation. (a) Mildest form. (b) No medullary symptoms. (c) Not unlike post concussion type. (d) Occasional temporary focal signs.

2. Stage of manifest beginning compression. (a) Exaggeration of first stage. (b) Cyanosis of face. (c) Veins turgid. (d) Papillary oedema. (e) Slow pulse and increase of blood pressure. (f) Meningeal irritation.

3. Stage of acme of manifest compression. (a) Marked evidence of capillary anaemia and medullary pressure. (b) Paralysis of varying degree. (c) Cyanosis marked. (d) Respiration—increased, stertorous and Cheyne-Stokes. (e) Pulse—slow, full and bounding. (f) Blood pressure—progressively increased. (g) Unconsciousness (cortical anaemia)—partial or complete. (h) Reflexes abolished. (i) Optic oedema marked.

4. Stage of paralysis. (a) Paralysis—complete and flacid. (b) Respirations embarrassed. (c) Pulse rapid and weak. (d) Coma—deep. (e) Pupils widely dilated. (f) Blood pressure fails. (g) Respirations cease before heart beats.

Let us for a moment consider the physio-pathological condition present in a recent brain injury. As a result of the injury we have an irritation of the vagal respiratory centers, with slowing of the pulse and respirations. At this time there may be no increase in blood pressure.

When the compression is equal to or greater than the systemic pressure (which

occurs when about one-sixth of the total brain contents have beeu displaced), the cerebro-spinal fluid escapes, the veins cannot empty and become distended, the cerebral capillaries are collapsed and anaemia of the brain produced. As a result of this anaemia the vaso-motor, vagal and respiratory centers are stimulated, which causes the systemic blood pressure to be increased until it is greater than the compressing forces and the anaemia is relieved. The pulse and respirations in the meantime become slow. If the cerebral compressing force is still active, this process may repeat itself several times and until the centers are exhausted from this continued stimulation. The pulse and respirations become rapid, the blood pressure is decreased (paralysis) and foretells a fatal issue.

If this is the physio-pathological picture, then the treatment must be of such a character as to relieve this compressing force and imperatively before the exhaustion of the medullary centers. That is, early in every case of severe head injury, when the clinical evidence points to an increasing intra-cerebral pressure, a subtemporal decompression should be done.

Lumbar puncture, if carefully used, is a valuable procedure. With marked intra-cranial pressure and a low cerebro-spinal pressure it is a dangerous procedure, because of the danger of medullary plugging of the foramen magnum. The vaso-motor centers are overcome and cerebral anaemia developes.

In every severe brain injury, careful and frequent observations must be made of: 1. The pulse rate. 2. The respiratory frequency. 3. The blood pressure. 4. The state of consciousness. 5. The condition of the fundus of the eye. 6. The pressure of the cerebro-spinal fluid.

In the past three years Sharp reports 239 cases of recent brain injury, 227 fractures of the skull. 79 operated, 14 deaths, mortality 17.7 per cent. 160 not operated, 63 deaths. He is convinced that in basal fractures treated with subtemporal decompression that meningitis, medullary compression and possible oedema and chronic wet brain may be averted. Another point of importance is the absence of extra-dural middle meningeal hemorrhage and increased frequency of multiple punctate hemorrhage, which is contrary to our text book exposition.

J. H. Long in the *Long Island Medical Journal*, after a study of 76 skull fractures, has been impressed by the following facts: The classical slow pulse and high pressure are absent in a large proportion which have an extensive intracranial hemorrhage. If the skull is only opened when these symptoms are evident, many cases which could be relieved are neglected. When the slow pulse and high pressure are present, there are indications of the reaction to high cerebral pressure and there is no reliable sign which will indicate whether the vital centers will be overpowered within five minutes or will continue to react and keep the blood pressure above the cerebral.

A patient in coma following a head injury is in a very critical condition and prognosis is uncertain. Decompression, if done at all, is in the great majority, done too late, i. e., when the indications are very clear. In the cases observed there has been none in which death was caused by the operation, but many in which prompt decompression would have preserved life. A few mild cases rapidly develop fatal symptoms and a few of the worst cases get well without operative aid.

In the fatal base fractures death occurs within 12 hours, in 13 of the 14 fatal cases. In the vault fractures death seldom occurs within 12 hours. Of the 12 fatal cases, 5 died between 12 and 48 hours and 6 lived more than 48 hours.

V. P. Blair in the *Journal of the American Medical Association*, reports his experience in unlocalized intra-cranial injuries. Of 42 cases, in 31 through a single or bilateral subtemporal operation, pulpified brain substance, a subdural clot or severe hemorrhage was dealt with. In seven other cases either an extra-dural clot or contused brain was expressed.

As a matter of interest he has made comparison between series with a run-

ning series of 80 basal injuries not operated on in another service. In these cases without operation there was 17 deaths within two hours after admittance and these were eliminated, leaving 63 injuries not operated on in which there was survival for two hours or more. In the series with operation, 17 patients were operated on within two hours.

In 63 patients not operated on who lived more than two hours, 35 per cent survived. Of the 42 patients operated on, 57 per cent survived. The time of operation would appear to be important. In half of the successful cases, but in only one-third of the fatal cases, the operation had been done within two hours. Of the patients on whom the dura was open within the two hours, 70 per cent survived.

The significance of time is indicated by the following: Of those not operated on who survived 24 hours, 58 per cent ultimately recovered. Of those operated on who survived 24 hours, 75 per cent recovered. Of those who survived 48 hours, about 75 per cent in either series ultimately recovered. Next to disturbance of the sensorium, the most constant single sign of severe brain injury was disturbance of the pupillary reflex. Of patients giving this sign in the series without operation, 27 per cent recovered, with operation 57 per cent recovered.

The subtemporal decompression consists in the removal of the squamous portion of the temporal bone from near the parietal ridge to the base line of the temporal bone, with incision of dura and draining of middle fossa for 48 hours.

All cases of brain injury following fracture of the base do not need operating, probably 50 per cent recover without it.

The important point under consideration is that the operation should be performed before the exhaustion of the medullary centers occur, for if done on a patient with an increasing pulse rate, it only adds shock and death.

Conclusions:

1. The dura mater is an important structure in brain injuries.
2. Concussion is a relative rather than a pathologic condition.
3. Compression of brain and medullary vital centers are the important factors in brain injuries.
4. All cases of brain injury that live are not necessarily cured.
5. A plea for a subtemporal decompression in brain injuries that show evidence of increasing intra-cranial pressure and thereby rescue the mortality and post traumatic incapacities.
6. Operation not to be considered in a rising or rapid pulse.

Discussion.

Dr. S. H. Landrum, Altus: Diagnosis in these cases of course is the most important thing to consider, and to make that diagnosis with the greatest safety to the patient is all important. It may often be done by making a preliminary spinal decompression. If the patient gets some relief from the withdrawal of 15 to 20 cc. of the spinal fluid, then we can do the cerebral decompression.

Dr. LeRoy Long, Oklahoma City: This is just the kind of paper we would expect Dr. Riley to read. It was very thorough. We should be very careful in coming to the conclusion that all cases of brain injury should be operated on quickly, and with reference to Dr. Sharp, of New York City, whose paper he quotes extensively, I think it is one of the most important works on this subject I have read for many years. I think cases of brain injury should not be indiscriminately operated on. They should not be operated on while in shock. In my judgment a subtemporal decompression should not be done with a fast pulse and low blood pressure. If the pulse goes down and the blood pressure is rising, then is the time to do the subtemporal operation. Therefore, the operation, as I see it,

and as has been pointed out by these men who have large experience, should be done first fairly early, that is before we have the development of paralysis. Do not do it when we have beginning of oedema of the brain. I feel like this question of how to treat these cases of brain injury is a question of the greatest importance. We see so much of it in Oklahoma City. We have had such a large clinic in this particular field and that is the conclusion we have arrived at, do not operate if he has a low blood pressure or high pulse.

Dr. K. R. Rone, Elk City: I appreciate Dr. Riley's paper, and believe it to be a most excellent one, for it is too often we do not know just what to do in a given case. Ischemia too often quickly ensues, and destroys the vitality of the tissues to the extent that it leaves its markings in after years. I think the question in surgery is not only a question to operate or not to operate, but how well our patient will get along after an operation. In my mind this is a serious problem. A great many of these cases will be followed by epilepsy and stupidity of mind, that will bar them from making the men they should be. Those cases of fracture of the skull, where we cannot operate so well, fractures followed by bleeding at the ears and eye symptoms, indicating the seat of fracture, should be guarded closely. We should disinfect the ears, and use sterilized gauze, and as far as possible prevent any invasion of a bacterial nature, that would lead to meningeal trouble.

Dr. Ross Grosshart, Tulsa: This is a subject that has given me a great deal of worry and one which I undertook to write a little essay upon four or five years ago, and I gave it to this society, on account of the surgery we have in our county. The oil fields are a place where there is more head injury than any place in the whole country, and I agree with what Dr. Riley and Dr. Rone have said in regard to the time of operation. You have to be governed, however, by what you do for a particular patient by the pulse, respiration and general condition of the patient. These patients you get out of the hospitals are not always well patients. The conditions that follow afterwards. I would rather be shot through the body and take my chances than to be hit over the head. These patients either lose their self control and are nervous and develop epilepsy, etc., and the patient who gets out of the hospital is not always a well patient, and the time to operate, as the doctors have indicated, is right.

Dr. John Riley, Oklahoma City, closing: I want to thank you for the discussion of the paper. It has been said that tradition is the blindest master that man can follow, and I believe that in injuries of the head we are passing through an experience, of much the same character, as in the treatment of appendicitis. Head injuries, with its tremendous mortality and incapacity, is a very serious question, and demands a most careful consideration. I do not believe that every person with an injury of the head should be operated, but I do believe that he should be carefully examined, every two hours if you are on the job. I believe that in many head injuries, a spinal puncture is invaluable in relieving that awful headache. This problem demands team work and careful examination if we are to reduce the present mortality and post traumatic incapacity. We no longer think of the bone injury in these cases, but it is a question as to what has happened to the patient's brain.

HERPES ZOSTER.

S. L. Immerman, Philadelphia, (*Journal A. M. A.*, June 2, 1917), says that herpes zoster may develop in any case of paresis and is often an initial symptom. Zoster involving the entire length of the upper extremity alone appears to be uncommon and this was the condition in one of the cases he reports. Two of the three cases were paretics and one a tabetic. The herpes in these cases was of a symptomatic variety, that is, he says, due to involvement of the ganglions in the pathologic processes of the disease. The nature of the ganglions changes, he holds, is probably specific, due to the spirochetes or toxins.

REMARKS ON ACCIDENTAL BRAIN INJURIES.*

ANTONIO D. YOUNG, M. D., Oklahoma City, Okla.

Recent study has brought about practical unanimity of opinion regarding the management of accidental brain injuries, and I am attempting to epitomize the subject for your consideration.

Depressed fractures of the cranium frequently are without general symptoms aside from temporary unconsciousness and even this is sometimes absent. However, if there is considerable bruising of brain tissue or there is rupture of a meningeal artery with consequent hemorrhage, the signs of cerebral compression appear. These are slow pulse, disturbed respiration, headache and slowly developing coma. The coma may appear in a few hours or a few days, but is usually marked by the end of the twelfth hour. Should the fracture occur over the motor area, hemplegia of the opposite side may appear instantly or in a few hours.

The treatment of depressed fracture is obvious. The fragments of bone should be elevated or removed as soon as possible and all meningeal bleeding vessels ligated. It would be a fine thing, indeed, if in a large single hemorrhage the exact spot could be located, the vessel ligated and the clot removed. Theoretically, this can be done but practically such an ideal procedure can rarely be accomplished because in most instances the hemorrhage is multiple and its exact site is very difficult to determine.

Linear fractures and fractures of the base of the skull cannot, of course, be palpated and the diagnosis is made by the symptoms of compression recited above and by bleeding from the ears and nose with or without escape of cerebro-spinal fluid, and by echemosis about the eyes, not caused by direct violence to the soft structures in this locality.

Occasionally the X-ray will show an otherwise unrecognized fracture, but the negatives are often disappointing. In a linear fracture, for instance, the angle at which the exposure is made may entirely obliterate the outline. However, it is often a useful procedure and should be used in all doubtful cases. It is also well to bear in mind the fact that fractures of the skull may occur without symptoms and the patient remain permanently well or he may suffer years after as a result.

More or less intra-cranial hemorrhage accompanies all fractures at the base of the skull and the danger to life lies in the cerebral compression thus produced, and not to the fracture itself. Where there is traumatic communication between the interior of the cranium and the external surface of the body, the liability of a subsequent meningitis must be borne in mind. I have seen this unfortunate condition occur months after the injury in a patient with basal fracture, whose cerebro-spinal fluid continually escaped through his nose. In the absence of characteristic symptoms in those patients where the nature of the injury suggests basal fracture, a special puncture often aids by showing a bloody spinal fluid. In this condition the blood in the fluid is hemolysed which deferentiates it from spinal fluid accidentally contaminated at the site of the puncture. However, blood is not always present even in subdural hemorrhage, hence its absence does not prove that intra-cranial bleeding is not taking place. Then, too, the withdrawal of a considerable amount of spinal fluid has a certain therapeutic value, in that it reduces intra-cranial pressure, thus helping to avoid oedema of the brain and lessening the tendency to stupor and delirium and relieving the severe headache. If, however, the intra-cranial pressure is very high, there is some danger of compressing the medulla in the foramen magnum with its consequent fatal result. I do not believe this to be a very common danger.

In some patients who have sustained a severe blow upon the head, there is no fracture of the skull and yet much damage to the cerebrum results. This con-

*Read before the Oklahoma State Medical Association at Medicine Park, May 9, 1917.

sists in hemorrhage, minute or gross, single or multiple, or in such a bruising as to produce a subsequent oedema or necrosis.

In oedema or hemorrhage, the signs of intra-cranial pressure before mentioned are present and in addirion ophthalmic examination shows a choked disk. Rarely is it possible to discover changes in the fundus occuli earlier than six hours from the time of the injury but slight blurring of the nerve may be present then and a distinct choke in ten or twelve hours. Ophthalmic examination is useless in extreme shock.

This naturally brings up the question of shock. Immediately after a severe brain injury, the patient is unconscious and shows a varying degree of "shock" as is evidenced by a cold sweat and a feeble pulse of high rate. If the patient does not die in a very short time, the signs of shock pass away and those of cerebral compression supervene. In shock the pulse is rapid, 120 or more, feeble and easily compressed, the respiration is rapid and the blood pressure is lowered. Many patients succumb sometimes during the first twenty-four hours without reacting. It is poor surgery to operate at this time, as the added shock only hastens the fatal termination; but if the patient is to have a chance for recovery, the pulse rate begins to fall, reaching sometimes to 40 per minute, the blood pressure begins to rise, and other signs of cerebral compression, including choked disk, appear. This is the time to interfere and other conditions being favorable, the operation should be done as soon as the decreasing pulse rate reaches sixty. If the operation is further postponed, oedema of the brain, or chronic "wet" brain, may result, ending in a rapidly fatal termination or a permanently diseased brain. The operation to be performed is a subtemporal decompression.

During shock the patient should lie unmolested so far as possible with perhaps a saline drip and coffee enemas.

The post traumatic conditions following an unrelieved damaged brain are chronic headache, lack of resistance to fatigue, vertigo, unstability as to employment, and epilepsy.

LEUKEMIA.

Maurice Packard and Reuben Ottenberg, New York (*Journal A. M. A.*, March 31, 1917), says that the earliest stage of leukemia is unknown and that cases showing no increase in the total number of leukocytes but a relative increase in the lymphocytes have later developed into typical lymphatic leukemia. There is, also, a close resemblance between the blood picture and pathologic lesions of aplastic anemia and those of aleukemic leukemia, a fact which leads to a suspicion that the two diseases have a sort of relationship. In aplastic anemia, a striking feature is the diminution of the granulated leukocytes in the circulation. The probable cause of this has been better understood in the last few years by Selling's studies on benzol poisoning. It seems probable that the agent in aplastic anemia acts somewhat similarly to benzol in destroying the leukocytes. Packard and Ottenberg have recently studied a case of aleukemic leukemia which developed into a typical, chronic lymphatic leukemia. During the leukemic stage a large blood transfusion was performed. The interesting point to which we wish to draw attention is that in spite of the fact that a great number of granular leukocytes were transfused in the patient, these leukocytes had entirely disappeared from his circulation twenty-four hours after the transfusion. That this rapid disappearance of leukocytes is not the exception but the rule, after transfusions in lymphatic leukemia, one of us can testify from observation in several similar cases. There are two possible explanations of this: either the leukocytes were removed from the blood and held in some internal organs or they were destroyed. Only extensive postmortem study can decide, but from the fact one does not find polymorphonuclears in any large numbers in the tissues, the destruction of the leukocytes seems more probable. In the case referred to, the patient was a young child weighing 53 pounds, and the amount of blood transfused, 250 c.c., was estimated to represent about a quarter as much as the patient's own blood.

FRACTURES OF THE BASE OF SKULL.*

CURT von WEDEL, Jr., F. A. C. S., Oklahoma City, Okla.

The recent articles of Sharp, Besly, Zimmermann, etc., have shown how appallingly high the death rate from basal fracture is. Besly reports a mortality of 53 per cent in a series of one thousand cases of cranial fracture of any type. With the advent of the automobile the increase of fractures of the base is indeed appalling.

The ordinary treatment of basal fracture is the time honored one of rest, ice cap to head, and morphine if restless. If the patient dies, we say, "Oh, he had a fracture of the base—what else could we expect." It is this attitude of comparative helplessness in the treatment of brain injuries that has allowed these cases to be almost neglected in the general hospitals. It is stated that they all die anyway. This is indeed true, if we procrastinate until the dangerous stage of medullary compression, and even the latter stage of medullary oedema have set in. In fact, any chance a patient might have is taken away by an operation at this late and dangerous period of medullary oedema—the operation being just added shock.

Early operation is advisable not only as a means to save life, but to lessen the danger of post traumatic conditions. How frequently these post traumatic conditions following basal fracture occur, we all know. Such conditions are due either to injury of the brain or to laceration of the brain itself, or in the majority of cases, to unrelieved, prolonged increased intra-cranial pressure resulting in chronic oedematous swollen brains. The fracture per se is not the dangerous factor of contention, but the subsequent hemorrhage, oedema, and resulting intra-cranial pressure.

It is far from the scope of this paper to advise operation in all cases of basal fracture. Indeed, it is to be heartily condemned in the presence of shock or severe medullary oedema. All cases of basal fracture should be carefully watched. Repeated blood pressure readings should be taken. Early, the pressure may be low due to shock, but it gradually rises, especially with a decrease in the pulse rate. These cases should never be operated on in shock, even if several days are allowed to elapse until severe shock has disappeared.

Repeated examination of the eye-grounds should be made as a routine, as it is often the earliest sign of pressure. The nasal half of the disk usually blurs first. The blood pressure should be as frequently taken, as slowly rising pressure is a very significant syndrome. Repeated lumbar puncture with examination for blood is often of great help. Great care, however, should be exercised, as the withdrawal of too large amounts may force the medulla into the foramen magnum, with fatal results.

Reflex changes are very interesting. The abdominal reflexes are usually depressed on the side opposite the cerebral lesion. At the same time a definite chaddock reflex may be elicited. Roentgen rays are of little importance in basal fractures.

Fracture is rarely the important factor in brain injuries. In fact if the fracture be so situated as to allow the escape of cerebro-spinal fluid or blood from within the cavity, an operation might be avoided by the consequent lessening of increased intra-cranial pressure. It is the associated increased intra-cranial pressure either from active bleeding or oedema due to brain injury which causes the trouble. In fact, many of the more severe cases may have no actual fracture. This increased pressure may so impair function and blood supply of the cortical nerve cells, that post traumatic conditions are certain to result. A prolonged increase of cerebro-spinal pressure, even though not severe enough to cause immediate alarming symptoms, may be a forerunner of a chronic oedematous wet brain with its resulting series of very important and often serious sequellae.

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*Read before the Section on Surgery, Medicine Park, May 9, 1917.

It is very important that we be neither too radical or too conservative, as it is but to hasten death to operate during shock. However, in delaying to the stage of medullary oedema, we have so procrastinated as to give our patient little hope of recovery. One of the most frequent causes of post traumatic epileptiform seizures following head injuries, is prolonged unrelieved intra-cranial pressure resulting in chronic wet brains.

Again allow me to emphasize early ophthalmological readings, the taking of repeated careful blood pressures, and careful spinal punctures on all suspicious head injuries. We should operate in the interval between the disappearance of shock and the increasing intra-cranial pressure and resulting medullary oedema. The operation of choice is the simple subtemporal decompression, unilateral or bilateral, with washing out of blood clot if necessary.

TRAUMATIC SHOCK.

The results of experiments on the nature and treatment of traumatic shock, in part as yet unpublished and in part drawn from previous works, are given by F. H. Pike, New York (*Journal A. M. A.*, June 23, 1917). These are of interest in view of possible or probable conditions in the present war. 1. When the sells of the brain and nedulla are deprived of blood for from ten to twenty minutes, a change in the staining reaction of the cells is demonstrable if the brain and upper portion of the spinal cord are removed some minutes after the circulation to the head has been restored. 2. The damaged cells show a greater susceptibility to strychnin. Paralysis and functional failure from strychnin during the recuscitation period occur more readily in the anterior (cephalic) portion of the central nervous system which has been exsanguinated than in the posterior portion where the circulation has been maintained. 3. Such damaged nerve cells will recover if a proper supply of oxygenated blood is provided and respiration, blood pressure, and pulse rate soon become normal. 4. Transection of the spinal cord in the upper thoracic region may be done without fatal results some hours after the circulation is restored. Such transection in animals with intact brain is not usually fatal. 5. But transection is fatal if done soon after a reestablishment of the cerebral circulation or soon after the return of the respiration and blood pressure to normal. 6. Section of the spinal cord in the upper thoracic level lowers blood pressure, but increased blood pressure by clamping or ligating the descending aorta just above the diaphragm will restore the failing conditions if done soon enough. 7. In case of severe damage to the central nervous cells no return of function or only an extremely slow and imperfect return is possible so long as the blood pressure remains low, but the condition may be improved by increasing the blood pressure artificially. The conditions become worse when a fall of blood pressure is brought about by some means which does not involve transection of the spinal cord. While the conditions in animals experimentally used do not coincide in all respects with conditions supposed to exist in traumatic shock from injury not involving the central nervous system directly, the author finds in them strong evidence for believing that some physical damage within the nervous system can be included as one condition of the shock. What the nature of this injury to the central nervous system is Pike does not attempt to say. Porter's views as to the effects of fat embolism as a cause of the shock are suggestive. He has no doubt that the systemic blood pressure of mammals is higher than is strictly necessary for the life of uninjured cells and there is thus a possibility of a factor of safety in the blood pressure of the organism in health. He holds that the general conditions of resuscitation apply also in surgical or traumatic shock which requires some raise of blood pressure.

APPLICATION OF THE PRINCIPLE OF BONE-GRAFT TO UNRETAINABLE RECENT FRACTURES.*

M. E. STOUT, M. D., Oklahoma City, Okla.

There is no part of surgery that has fallen so much behind, as that of the Osseous system. On every hand we see men doing expert abdominal surgery, expert gynecological surgery, expert surgery of the ear, of the eye, of the nose, throat, and so-forth, but there are few men doing bone surgery.

We are not taking advantage of the fact that bone can be transferred just the same as skin, or any other tissue. Indeed not unitl our illustrious Murphy began talking and writing on this subject, did we have any conception of its value. True, a few men in Europe had been doing more or less experimental work for a number of years, but they had not proved the practical use of it, and it was here as it was in many other problems of surgery, for him to demonstrate its practical application. As you all know, he made use of the intra-medullary graft, and was very skillful in the application of it. But for us who are not so expert as he was, it is rather difficult to apply in many cases of small bones, and short fragments.

But, Albee has conceived the inlay method, which is more applicable, and even more scientific, when we consider that it gives exact coaptation, with periostium to periostium, cancellus tissue to cancellus tissue, endostium and marrow to endostium and marrow, which are factors of vital importance in the role of osteogenesis. Albee has not only conceived this method, but has ingeniously invented tools, whereby the work may be done speedily with accuracy, and the least amount of trauma, and I need not say to you that these are points which are very essential to the success of the work.

At this time I shall not consider its application in the treatment of ununited fractures, or fractures of the neck of the femur, two of the greatest fields for it; nor shall I consider its use in Pott's disease, or innumerable other conditions, where it seems to be the only treatment of choice. For in these the method of procedure somewhat differs.

But in simple fractures, that cannot be maintained by external appliances, I know of no greater remedy at our command. Take for example a fractured malleolus or a short fragment of the tibia, fibula or radius. Where can we find a more suitable structure for maintaning its position, than a section taken from this same bone, and simply slid a few inches to bridge the chasm.

The technique of the operation is practically the same whatever the location of the fracture, and consists in making a liberal incision directly over the point of fracture, then with the twin saw cut a section four or five inches long, on one end, and two or three on the other. Remove the short fragment and simply slide the long one down to fill its place, and secure it with kangaroo tendon. Then the short piece may be inserted above to fill the vacancy.

I know that many of us have been accustomed to treating these cases with Lane's plates, wires, and wire nails; but one does not need to be in Albee's clinic long to see many gratifying bone-grafts upon patients that have previously been plated, wired, or nailed, without success. And when we consider that we are introducing a foreign material, and that around every screw and wire or nail there is more or less ischemia and necrosis, we know that they are inclined to predispose to infection to a certain degree, and that they inhibit osteo-genesis has been amply proved by the number of non-unions following their use.

On the other hand by the proper use of the graft, we can maintain the position just as accurately and firmly, and not only avoid these sources of danger, but we make use of the greatest stimulating factor known in osteo-genesis, that of the autogenous living graft.

But in doing this work it is well to remember that they should not be operated immediately following the injury, as there is always more or less trauma and lacerations of the soft parts around, and about the point of fracture with infiltration of blood which produces an excellent field for infection. But by waiting from six to

*Read before the Section on Surgery, Medicine Park, May 9, 1917.

eight, or even ten or fifteen days, repair has begun to take place, and there is a marked local leucocytosis, with a coffer-daming of the tissues which renders them much more resistant to infection.

Now as regards the after care, they should be put in a good heavy cast of generous length, which should be split from one end to the other, so that it may be pried apart to accommodate for swelling. This should be carefully watched for during the first week, with the idea of never allowing the cast to become tight; as the swelling subsides the cast may be easily tightened by drawing it together with adhesive plaster.

We should also inquire for points of pressure and remedy them by fenestras, if they occur. I do not dress the wounds until the cast is removed. The time for this varies from four to six weeks according to the location. We often have a discharge of serum, but this gives no trouble, and should be let alone unless there are signs of infection, which seldom occurs if a rigid technique is adopted; and the closer one keeps to the no-hand-contact of Lane, the fewer infections he will have.

Discussion.

Dr. A. H. Bungardt, Cordell: I feel like emphasizing a few points. We all know that bone work is a part of surgery that gives us the most trouble. We believe there are more damage suits due to ununited fractures and bones than anything else. In a great many cases we must resort to methods that suit the particular case first. I agree with the doctor in regard to the application of Lane splints and your wire, etc., and it has been my experience that these bone grafts gave more or less trouble. A foreign body in a tissue is not a very good thing. An immediate operation after a fracture is bad surgery. It is better to wait a week or ten days until nature has been able to ward off disease and so protect it from infection. I think the inlay graft is the best method of repair and splinting should be very extensive.

Dr. R. L. Hull, Oklahoma City: Just to emphasize that this work is practicable only to well equipped hospitals, and there are certain instruments absolutely necessary. There is just one point I want to bring out, that is, we have been compelled to operate on too many patients immediately on account of the restlessness of the patients and friends. We are compelled to do that which in our own judgment we should not do. The method of fixation is applicable in most every case of bone surgery. Dr. Albee has a graft which is called the fish bone graft (draws diagram). It is especially good on the smaller bones. I believe it is being demonstrated that we have not got to use autogenous grafts for this work; that the multiple inlay graft will give you good results that are small in area. I know that as far as getting results are concerned that the multiple inlay graft is satisfactory.

Dr. Livermore, Chickasha: I heartily agree with Dr. Stout's paper and it is very applicable in many places. With the X-ray showing the exact position of the bone, we are apt to operate on cases where we would get as good results without operation. I mean by that that the bone does not have to always be exactly set to make good results. Sometimes an X-ray will show that your bones are not exactly placed but they are all right. Bone work is simple work if you are prepared to do it, but it should not be undertaken without the necessary instruments, etc.

Dr. Stout, closing: I appreciate the free discussion on this paper, and I am sure that the more expert we become in this work the fewer open operations we will do. And I certainly would never advise open surgery where good apposition can be secured and maintained by external appliances, and even where the apposition is not exact, if we feel sure of a good functional result, I question the wisdom of open surgery, but there are a certain number of cases where the result will be disastrous if we depend upon external appliances alone. And in these cases we must resort to some operative procedure, but I would not have you think that I am advocating this method to the exclusion of all others, for many cases can be best secured by kangaroo tendon alone, and it may occasionally be permissible to use a small wire nail, but the sooner we abandon the promiscuous use of foreign material, and begin directing our efforts toward some other means of fixation, the better we are going to get along.

JOURNAL OF THE OKLAHOMA STATE MEDICAL ASSOCIATION

VOLUME X AUGUST, 1917 NUMBER 8

PUBLISHED MONTHLY AT MUSKOGEE, OKLA., UNDER DIRECTION OF THE COUNCIL

DR. CLAUDE A. THOMPSON, EDITOR-IN-CHIEF

ENTERED AT THE POST OFFICE AT MUSKOGEE, OKLAHOMA, AS SECOND CLASS MAIL MATTER, JULY 28, 1912

THIS IS THE OFFICIAL JOURNAL OF THE OKLAHOMA STATE MEDICAL ASSOCIATION. ALL COMMUNICATIONS SHOULD BE ADDRESSED TO THE JOURNAL OF THE OKLAHOMA STATE MEDICAL ASSSOCIATION, 307-8 SURETY BUILDING, MUSKOGEE, OKLAHOMA.

The editorial department is not responsible for the opinions expressed in the original articles of contributors.

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Local news of possible interest to the medical profession, notes on removals, changes in address, deaths and weddings will be gratefully received.

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EDITORIAL

OUR SCHOOLS AS DISSEMINATORS OF DISEASE.

We called attention last year to a condition ever recurring in the history of our schools, we presume not different from that of other states, and that is the marked increase of certain infectious diseases concurrent with the opening of the school year.

The factors causing this increase are well understood by health officers and physicians as a rule, but the small minimum who do not understand the dangers or who take no active steps to check infections are probably responsible for the increase more than any other one cause.

Dr. Van Cleave of the Indian Service is authority for the statement that at the Tuskahoma school the number of cases of malaria in September were 33, in October 15, and in November 5. All these cases were imported from malarial districts. He is of the opinion that it would not be bad practice to give all the entrants antimalarial treatment as soon as they enter, in order to forestall establishment of the infection generally.

In Pryor a very unusual situation arose. Measles becoming prevalent the town council met and sagely, without the advise of medical authority of course, declared that quarantine was unnecessary, that the disease was harmless, etc. Of course these misguided lawmakers did not know that measles probably killed more children in this state in 1916-17 than either smallpox, scarlet fever or diphtheria. This occurred in the home town of the State's great orphanage, where by reason of the naturally inherited weaknesses the children have they are more than usually susceptible to infections, and where an epidemic of measles would more than likely be followed by death or such severe complications that soon other infections would produce similar results.

In a few weeks many hundreds of schools will again open and we will begin the same old tiresome process of quarantine after an infection has thoroughly implanted itself in a neighborhood. Why not begin now by advising the various school trustees of the dangers? We need our resources at this time for other mat-

ters of great importance, why not conserve them by properly cleaning up the school houses and grounds, pumping the wells dry and treating the suspicious ones with hypochlorite, preparing sanitary, well located and fly proof soil closets, and above all, insisting that sick children be inquired into before their return to school with the possibility of infecting the well? In Oklahoma this latter is the crux of the matter. More infections are spread by teachers, parents and physicians winking at the return of an infected child to school than by any other means. One Muskogee parent probably stated correctly the attitude of a certain class when she heartlessly exclaimed, "Well! Why should she not return to school? Was she not infected there?"

WILL THE GOVERNMENT DRAFT PHYSICIANS?

There are indications that such a step may be found necessary. If reports are to be credited, the War Department is not securing the number of physicians they deem sufficient and the general unrest as to that phase of the matter is already reflected in the action of some medical organizations, which in effect suggests that such a step be taken.

To carefully consider the matter, it has been suggested that a meeting of the state committees on medical defense be held and that they endorse the proposition to apply some system of selective draft to the medical profession in order to secure the necessary number of men. Maryland has already taken this step and endorsed the move. The suggestion carries the idea that the General Medical Board of the Council of National Defense would, if it met the approval of the Surgeons General of the Army, Navy and Public Health Service, present the matter to Congress and ask that the necessary legislation be adopted.

We have always held, since the selective draft has been in process of organization, that the age limit should have been more than 31 years—45 years would have worked no injustice, for, those not physically fit or otherwise unsuited for service by reason of dependents or situation as to vocation could have been excluded as they are now excluded, but that limit would have done something devoutly to be wished in many localities, and that is the forceful securing of a certain worthless class of loafers and spongers who have never been of service in any capacity to either the city, state or Nation. This description in no wise applies to physicians or our profession as a class, but does apply to many individuals who are mere excresences on civilization, who for years have ornamented our street corners, pool-halls and police courts, paying no taxes, creating no worthy thing, having no ideals or noble aims for the future, rarely any interest in the affairs of the country which gives them a right to idleness and wastefulness. What nobler end could they come to than in one of our National cemeteries, where under the sod, they would be oblivious to the sympathetic hands decorating the graves of our sainted dead.

Now if Congress passes an act calling for physicians, it is doubtful if they can get a law not applying to one age alike. If they want 45 or 50 year old doctors, they must probably provide in the act for the same age as to other vocations and professions.

Every physician must, of course, determine his own course of action in this matter. Many who others think should go have affairs which the neglect of or absence from will be badly injured by leaving their work. This especially applies to physicians heavily in debt who have no means of relieving the claims on them except to keep at the eternal grind of private life and toil. Those having large families must necessarily, in the absence of accumulated savings, remain at home. Those who can arrange their affairs, even to the extent where the going means much sacrifice, should arrange them at once and apply to the authorities for examination and assignment.

VOLUNTEERING FOR SPECIAL WORK.

There is an impression among physicians that they may offer their services to the War Department, reserving to themselves the kind of work they will perform. Many physicians are inquiring if they may be commissioned for the performance of certain services. They cannot be. When a physician is commissioned he must perform the service he is ordered to perform, which of course, is in keeping with the services performed by other medical officers similarly placed.

The government is attempting to secure for medical officers, well balanced, capable men;—men who with little effort can fill any ordinary position they may find themselves in, consequently an offer with a string to it, one suggesting that the volunteer will tender his services provided he is to be sent to France, or if given some preferential position, is simply no offer at all.

THE OSTEOPATH WANTS TO GO.

It is said some soul in Washington, some great legislative mind with the "good of our fighting men at heart" is proposing that a certain number of osteopaths be attached to the military arm as medical officers. It is not said the osteopath is stimulating this great demand, but every one may draw his own conclusions. While drawing do not forget the great call for this particular species that has not yet been heard reverberating from the fields of striving Europe, which so far has been able to strive along in some manner without the aid of these skilled adjustors. We hardly think the Congress will make Americans the laughing stock of efficient medical Europe by sending along clowns, Christian Scientists and healers with the divine touch, but if we are to send a joke, let's send a real laughable one. It would fit the occasion to send one each of the following indispensable cults: Osteo-chiro, Christian Scientist, magnetic healer, mesmerist, holy roller, etc., and if at the last moment some great field is discovered as having been overlooked, include one of of that tribe too.

CURRENT MEDICAL LITERATURE

Conducted by

DRS. CURT von WEDEL, Jr., and L. J. MOORMAN, Oklahoma City
and FRED J. WILKIEMEYER, Muskogee

CHOLECYSTECTOMY.

By Major G. Seelig, St. Louis, Mo.

(Surgery, Gynecology and Obstetrics, July, 1917.)

In a rather extensive article, the author takes up the question of the best method of technic for cholecystectomy. He states that many times it is more difficult to excise the gall bladder from the cystic duct outward, than it is by the old method of grasping the fundus and stripping it downward. He believes one reason there are more reported injuries of the hepatic and common ducts in this country than in Eurpoe, is because of the prevalent use of the method of removing the gall bladder from the cystic duct outward. He thinks it is easier to successfully ligate the cystic artery by his method, and that by holding upon the cystic duct, one may easily be able to probe the hepatic and common ducts with a copper probe. It is a mistake to ligate the artery and duct in a mass. Each should be ligated separately.

His method of procedure is as follows: The gall bladder is grasped, the incision made on each side of the gall bladder and it is then stripped downward (compressing the liver if there is any oozing), until the main trunk of the cystic artery is reached, which is then ligated. The cystic duct is clamped above, cut, and the edges of the stump are grasped by fine artery forceps and the ducts probed. The stump is then ligated and a drain placed above the foramen of Winslow. In this same paper he mentions an incision which commences at the ensiform and runs downward over the belly of the rectus muscle. The anterior sheath is opened to the full extent, and the rectus contracted outward. He believes that by this method a much better exposure can be obtained.

PULMONARY FAT EMBOLISM—A FREQUENT CAUSE OF POST-OPERATIVE SURGICAL SHOCK.

By Wayne W. Bissell, Rochester, Minn.

(Surgery, Gynecology and Obstetrics, July, 1917.)

Death following operation associated with rapid pulse and a fall in arterial pressure with a rise in venous pressure is usually accredited to so-called surgical shock. The author believes, however, that many of these deaths, if autopsied, would be shown to be due to fat embolus.

He discusses in detail three autopsies of fatal cases, and states in conclusion that:

1. Deaths clinically supposed to be due to surgical shock are due, in so far as this experience goes, to pulmonary fat embolism and its attendant blood pressure phenomena.

2. Pulmonary fat embolism causes a lowering of arterial blood pressure and an elevation of venous blood pressure which may be sufficient to cause death.

3. Infusions (intravenous) are contra-indicated, because of the increased pressure on the right heart.

4. By simple methods pulmonary fat embolism is easily demonstrated at necropsy.

PERSONAL AND GENERAL NEWS

Dr. C. M. Robinson, Stilwell, has moved to Nowata.

Dr. T. B. Hinson, Enid, is doing special work in Chicago.

Dr. A. L. Stocks, Muskogee, is doing special work in Rochester.

Dr. and Mrs. H. C. Manning, Cushing, are visiting in Kentucky.

Dr. and Mrs. J. E. Yarbrough, Erick, have returned from Chicago.

Dr. Geo. H. Nieman and family, Ponca City, are visiting in Colorado.

Dr. I. D. Walker, Antlers, has returned from post-graduate work in Chicago.

Dr. O. C. Coppedge and family, Bristow, are touring Colorado by automobile.

Dr. G. A. Kilpatrick, McAlester, has returned from a visit to the Mayo Clinic.

Dr. and Mrs. V. H. Barton, McAlester, motored to eastern Texas points in June.

The Oklahoma Baptist Hospital, Muskogee, is having plans drawn for a $30,000.00 addition.

Dr. and Mrs. Phil Herod, El Reno, recently made an automobile trip to Clovis, New Mexico.

Dr. J. Lee Riley, Henryetta, has been commissioned as 1st Lieutenant, Medical Reserve Corps.

Dr. J. W. Board, Okemah, is moving to Guthrie, where he will be associated with Dr. Lovelady.

Dr. J. M. Bonham, Hobart, has returned from an extended trip to Chicago where he took special work.

Dr. Benjamin Brown, Muskogee, has been commissioned as Captain in the Medical Reserve Corps.

Dr. F. Y. Cronk is moving from Guthrie to Tulsa, where he will be associated with Dr. Ralph V. Smith.

Dr. J. H. Woodcock, Muskogee, has moved to Miami where he will be associated with Dr. J. D. Bewley.

Dr. C. Z. Wiley and family, Tulsa, are visiting Dr. A. Ray Wiley at the New York Polyclinic Hospital.

Dr. G. M. Rushing and family, Durant, motored to Alabama points where they are visiting relatives.

Dr. George Hunter, city physician, Oklahoma City, has advised the people of that city to boil their drinking water.

Dr. H. H. Cloudman, Oklahoma City, has been reelected school physician, a position he has held for several years.

Dr. J. W. Moore, Addington, has suffered severely for some weeks with an infection of the hand. He is now improving.

Dr. N. W. Mayginnes and family, Tulsa, are touring Colorado and Northwestern points. They will not return until cold weather.

Dr. J. F. Messenbaugh and family, Oklahoma City, are in Colorado Springs. After a time Dr. Messenbaugh will visit the Mayo Clinic.

Dr. L. C. Kuyrkendall, McAlester, who is now attached for training at Ft. Bliss, Texas, has been confined to quarters with scarlet fever.

Dr. Ed. D. James, Haileyville, has sold out and will move to some Missouri point. Dr. James has been located in Haileyville for fifteen years.

Dr. S. P. Strothe, for many years located in Altus, is moving to Holdenville, where he will have charge of the newly organized Holdenville Hospital.

Dr. Thos E. Shepard, Tulsa, announces he will not contest the decission of the Oklahoma State Board in revoking his license. He will retire to private life.

Drs. E. E. Rice, J. A. Walker, H. A. Wagner and T. D. Rowland, Shawnee, have passed the Medical Reserve Corps examination and are awaiting orders.

Dr. G. C. Croston, Sapulpa, has filed suit against the county commissioners of Creek county, alleging the abrogation and non-payment of his services as jail physician.

Dr. R. L. Kurtz, Nowata, has announced that owing to his acceptance of a commission as Captain in the Medical Reserve Corps, the Nowata Sanatorium will be closed.

Dr. C. V. Rice and family, Muskogee, are in Chicago for six months where Dr. Rice has secured an appointment for that time in order to make a special study of pediatrics.

Medical Officers of the 1st Oklahoma Infantry were ordered for physical examination at Oklahoma City, July 23. This examination is preparatory for final entry into Federal service.

Drs. E. A. Campbell, Heavener, S. D. Bevill, Poteau, and R. L. Kurtz, Nowata, have received commissions in the Medical Reserve Corps. The former two as lieutenants, the latter as captain.

Armour and Company announce the preparation of 1-2 cc. ampoules of pituitary liquid in order that physicians demanding smaller dosage may be accommodated. The new package comes 6 ampoules in a box and retails for 65 cents.

Dr. J. D. Osborn, Chairman Tillman County Red Cross, anhounces that "Four Minute" men will be selected to make addressess of that length between the acts at picture shows. The talks will cover all ranges of Public Health activities.

Dr. John W. Duke, State Commissioner of Health, has given notice that license for 1917 was due July 1st from hotels, rooming houses, restaurants, drug stores, drink fountains, confectioneries, fruit stores, groceries, meat markets and bakeries.

Dr. D. C. Sanders, Boswell, charged with unprofessional conduct in that he offered to cure and accepted fees for such, in the matter of incurable diseases, was exhonorated by the State Board of Medical Examiners at the Oklahoma City meeting.

The Oklahoma Baptist Hospital, Muskogee, held its annual commencement exercises June 26. The graduates were Misses Grace Hill, Gertrude Hamilton, Lydia Scharmacher, Pauline Kennedy, Margaret Bunge, Vera Dunlap and Lillie Blanchard.

Medical Reservists Accepted. Drs. B. T. Bitting, Enid; W. J. Omer, Thomas; C. M. Ming, Okmulgee; T. F. Renfrow, Billings, have been commissioned in the Medical Reserve. Dr. Bruce Watson, Perry, will move to Billings to look after the work of Dr. Renfrow during his absence.

The State Laboratories will not be moved from Guthrie at this time, it is announced. It was hoped to have them housed in the new State Hospital, but as the appropriations for that have been tied up, the removal may be deferred for some time yet, or until arrangements can be made for proper quarters.

Dr. C. Howard Davis, of Toltec, Arizona, for many years a McIntosh county physician, visited Oklahoma in June. Owing to the fortunes of war Dr. Davis, who was surgeon for one of the Mexican Railways prior to the Mexican Civil War, has experienced many thrilling adventures and suffered viccissitudes not usually accorded to man.

Drs. J. L. Patterson, Mutual; Fred Patterson, Fargo; and F. H. Racer, Woodward, have passed examination for the Medical Reserve Corps. Applications have been made by Drs. T. D. Triplett, Moreland; C. E. Davis, Woodward; C. J. Forney, Woodward; and C. W. Tedrowe, Woodward. Probably no county in this or any other state has offered as high a percentage of its physicians as this.

The School for the Blind. An additional building at the School for the Blind was provided by the last legislature. In a short time the School will be able to receive thirty or forty new pupils. The management of the School would call the attention of the public to the fact that the School for the Blind is a state institution and that it was established for the education of not only those who are totally blind, but for those who, while having some vision, are unable to attend the public schools. It is requested that any one having a child so afflicted, or having knowledge of such a child, write to the school for information. Address O. W. Stewart, Superintendent, School for the Blind, Muskogee, Oklahoma.

DR. RALPH F. KOONS.

Dr. Ralph F. Koons, El Reno, for many years located in that city, died Sunday, July 7, after an illness of short duration. Death was due to uremia. Dr. Koons was born at New Columbus, Ohio, January 6, 1876. His preliminary education was obtained at Bucknell University, his medical at the University of Michigan, graduating in 1901. During his busy life he had held interneships in The Marine Hospital Service and for a time was secretary and superintendent of Canadian County Board of Health and was a veteran of the Spanish-American War. He was married in 1906 to Miss Maude Conklin, who survives him, and he leaves three children. Dr. Koons, it is said, enjoyed a large practice in El Reno and Canadian County.

Dr. S. O. Taylor, Ringling, is attending the New Orleans clinics.

Dr. A. M. Chambers and family, Quinton, are motoring to New Mexico.

Dr. Benjamin Skinner, Pawhuska, is doing special work with the Mayos.

Dr. M. M. Webster, Stratford, was seriously crippled recently when thieves drove away with his Ford.

Dr. G. W. Taylor, El Reno, has been appointed county health officer, vice Dr. R. F. Koons, deceased.

Drs. Harry Sims and Fred Fannin, Stigler, have passed their examinations for the Medical Reserve Corps.

Dr. and Mrs. J. C. Watkins, Checotah, have returned from a four months visit to Chicago where Dr. Watkins spent his time doing special work.

Dr. J. A. Muller, formerly of Snyder but for some time in El Paso, Texas, with the M. R. C., has been advanced to a Captaincy and ordered to San Antonio.

Dr. Robert I. Allen, Nowata, and Miss Maude Elizabeth Oschman were married in Claremore, July 16th. They will be at home in Claremore after September 1st.

Dr. R. L. Hall, Pawhuska, a member of the Oklahoma Senate and one of the men more than ordinarily responsible for the enactment of the definition of practice act, has sold out his Pawhuska ranch. It is said the price was $137,000.00.

Dr. J. M. Bonham, Hobart, is going to try to make a "loose mouthed" chiropractor pay for his scientific statements anent the administration of antityphoid vaccine. The Chiro, it is said, circulated or caused to be circulated statements that the administration was injurious to certain patients of Dr. Bonham's, and he will now have an opportunity to show in court how much he really does not know about such things.

Dr. Thomas E. Shepard, Tulsa, faced charges of unprofessional conduct as the result of an alleged criminal operation which caused the death of Loyce Smith of Tulsa, brought before the State Board of Medical Examiners The Board revoked the license. Prior to this time Dr. Shepard had been arrested, but was released at the preliminary trial. Tulsa County authorities have refiled the charges and after arrest the prisoner was released on bond.

Dr. Emma Starr Keith, Muskogee, has been appointed school examiner. The appropriation for this appointment has been made from year to year for some time, but the school board, in its infinite wisdom, has heretofore not deemed it of sufficient importance to fill this important position. A slowly increasing prevalence of infections incident to school environment, the last few months, has blessed Muskogee with more measles and similar contagions probably than any other locality in the State.

The Prussian War-Lord's Voice. "Barbarians understnad war better than we Europeans. They have no rules, no code, no conventions in war. Kill your enemy in any way you can, and when you have killed him in sufficient numbers that he can no longer resist you, enslave him—that is the barbarian theory of war, and that is the right one."—Statement made by Von Hindenberg in an interview given before the war to Capt. Armanthos Kaftan-Oghiou, for many years legal adviser of the Turkish embassy in Berlin.

"All Gaul is divided into three parts," said Caesar. Well, Caesar, you were reckoning from poor premises. You overlooked some gall in Oklahoma when you laboriously penned your commentaries. The Chiropractics state they have made application to the proper authorities to organize a unit for war service. They do not say just what the service is or could be, just one fell word, covering the whole gamut "service" is used. We can see Generals Gorgas, Braisted and Blue hurrying about Washington, all other activities of their offices at a standstill, as they congratulate themselves on this successful addition to the departments and prepare for the early advent of these wonderful scientists, who have only to twist the spine of the typhus patient, the tetanic sufferer, the gas poisoned victim, in order to send him back to the trenches fit to fight after one little "adjustment" or so. It is said that with this offer it will not be necessary to further enroll physicians for war service. So far as surgical and medical activities go the United States will be "prepared."

The Oklahoma Council on Defense has this to say concerning certain interesting phases of its work:

The Call to College.

During this war and following it there will be such a shortage of college trained men and women as has never before been known. Federal authorities are urging that young men and women be kept in colleges and universities until their services are absolutely necessary to the national defense.

The best interests of the nation demand that the supply of college trained men and women be kept up. Europe, with most of her universities closed and with hundreds of trained men already killed in the trenches, is looking to America for relief. And wonderful opportunities await the young man and the young woman who are technically trained.

Oklahoma Council on Defense.

SOCIETIES

Oklahoma County Dental Society has offered to treat such recruits as may need their services, without charge.

McIntosh County Medical Society met in Checotah July 3 with the following program: "Normal and Pathologic Labor," W. D. Berry, Muskogee; Clinics and Case Reports.

Oklahoma City Medical, Dental and Veterinarian organizations are perfecting plans for the establishment of a library to be incorporated in the present Carnegie Library. Drs. J. S. Hartford and W. H. Bailey represent the Medical profession in the matter.

Rogers County Medical Society meeting at the summer home of the president, Dr. Walter E. Smith, of Collinsville, passed a resolution assessing $5.00 monthly from each member, the sum to go toward the payment of fifty dollars per month to physicians of the society who go to war.

Marshall County Medical Society held a meeting July 3 at Kingston, Dr. T. A. Blaylock, Madill, presiding. The program: "Medical Organization," A. E. Ballard, Madill; "Intestinal Autointoxication," Dr. Dickerson, Aylesworth; "The Fee Bill and Ethics," J. A. Rutledge, Woodville; "Throat Infections and the Accessory Sinuses," O. E. Wellborn, Kingston.

The State Board of Medical Examiners elected the following officers at the July meeting: President, J. J. Williams, Weatherford; Secretary, R. V. Smith, Tulsa; Vice-President, M. Gray, Mountain View; Treasurer, O. R. Gregg, Freedom. The election of Dr. Smith was made to hold until the next meeting by which time he will probably be attached to the Medical Reserve Corps, necessitating another election for that office.

The Stephens County Medical Society held a very interesting meeting at Duncan, June 27th. The attendance was the largest had for some time. Most of the day was spent in discussing "Our Bit in the War." The duty of those that remain at home towards those that go to the front and risk their lives and sacrifice their practice for their country's cause and the future liberty of their children was the paramount issue. The Oklahoma County plan, with some modifications, was adopted. While none volunteered their service, it was freely expressed that Stephens will furnish her quota.

Mid-summer Meeting of the Central Oklahoma Medical Association
—Secretary's Report,

Ione Hotel, Guthrie, Okla., July 10, 1917,

Meeting called to order at 2 p . m. After reading of the minutes the scientific program was taken up at onec.

The Address of Welcome by Dr. A. A. West of Guthrie was in the form of a clinic, in which he presented two cases of residual paralysis following Infantile Paralysis and one case of birth dislocation of the shoulder.

Dr. A. J. Coley of Oklahoma City gave a very interesting paper on Summer Diarrhoea of Babies, in which many valuable points were brought out.

Dr. C. B. Barker of Guthrie had a large Eye and Ear Clinic, in which he showed about a dozen different conditions which proved of much interest, especially to the eye and ear specialists present.

Dr. W. E. Dicken of Oklahoma City reported a case of Ovarian Calcification and exhibited the specimen. Reports of this condition are rare in the literature, but the discussion brought out the fact that a number of men had had similar cases.

Dr. J. H. Maxwell of Oklahoma City reported a case of Hepatic Abscess following a Ruptured Appendix, in which he made a strong appeal for more accurate diagnosis and early operation.

Dr. C. J. Fishman of Oklahoma City reported a case of Spleno-Myelogenous Leukemia, which showed a marked remission following vaccination for small-pox.

During the recess which was taken at 4:30 p. m., the profession of Guthrie gave an auto ride to the visiting physicians to the hospitals, where light refreshments were served, and to other places of interest, ending at the Municipal Bath-house, where most of the visitors enjoyed a swim in large pool. All met at the Ione Hotel for dinner at 6:30 p. m.

Evening session was called to order at 8:00 p. m.

Dr. Rex Bolend of Oklahoma City gave a very instructive talk on the Duties of the Medical Reserve Officers, in which he pointed out that unless the physicians responded better the government would probably have to draft them.

The paper on Fractures of the Neck of the Femur by Dr. M. E. Stout of Oklahoma City brought out a lot of discussion and many questions were asked about the technic of the bone-graft operation.

Dr. C. D. Blachly of Drumright explained a very clever method of marking X-ray plates by writing the data on the envlope with an ink made of glue and lead filings before the exposure is made.

Dr. A. P. Gearhart of Blackwell reported three cases of Meckel's Diverticulum, one of which was diagnosed before operation.

Dr. W. A. Fowler of Oklahoma City gave some very valuable suggestions in a paper on Uniform Routine for Management of Obstetrical Cases.

Dr. W. Eugene Dixon of Oklahoma City read a paper and reported some cases of the Antrum as a Focus of Infection.

The meeting adjourned with a vote of thanks to the management of the Ione Hotel and the Logan County Medical Society. Dr. W. H. Bailey, Sec'y.

MISCELLANEOUS

DEPARTMENT OF PUBLIC HEALTH,
Dr. John W. Duke, Commissioner, State Laboratories,
Guthrie, Oklahoma.

DIRECTIONS FOR MAKING BLOOD SMEARS FOR MALARIAL EXAMINATION AND DIFFERENTIAL BLOOD COUNTS.

1. If Malarial examination is wanted, specimens should be taken, if possible, shortly before a chill, but never within less than ten hours after one. In typical cases, take at time of lowest daily temperature.

2. Specimens should be taken before quinine is administered.

3. The slides must be perfectly clean and free from fat. Thorough washing with soap and water and rubbing with alcohol will usually suffice.

4. Cleanse the lobe of the ear (or finger) with alcohol.

5. Work must be done quickly before coagulation begins.

6. Prick the skin deeply to ensure a free escape of blood and discard the first drop or two. Allow a small drop to flow on a slide near one end. A second slide is held at an angle of 45 degrees to the first one and touching the drop of blood. Allow the blood to spread out by capillary attraction along the edge of the second slide. Then quickly draw the blood along the first slide with a clean sweep, exerting little pressure. Dry in air.

7. In sending blood smears to the laboratory, three slides are desired. For Malaria examination one smear should be thicker than the others.

8. Protect well in a wooden or tin box and send by mail to the State Board of Health, Guthrie, Oklahoma.

9. Slides will be sent upon request.

PREVENTING BABY BLINDNESS.

The new vital statistics law for the state of Oklahoma will go into effect on July 1st. Not only will this law result in fuller and more accurate vital statistics, but it will also have the effect of reducing infant blindness in Oklahoma. Every physician making out a birth certificate will be urged to use a harmless solution on the eyes of each baby, a solution which is a practically certain preventive of infant blindness.

No more terrible tragedy can be imagined than a life of total blindness, and this tragedy is the more pitiable because in so many cases it is absolutely unnecessary. It is a conservative estimate that three-fourths of the cases of infant blindness could easily have been prevented. The operation of using the solution in question is a simple and painless one, but it should be done only by a physician or trained nurse. One of the most important factors in preventing infant blindness is to take this precaution in time. The right way and the only way is to use it on the eyes of all babies at the time of birth. In any case, if the slightest symptom of sore eyes appears the mother or person in charge should report the matter to a physician without the slightest delay. Often a small delay means the difference of the baby preserving its eyesight or being blind for life. A few years ago the value of this solution was not realized. Now there is no excuse for any physician failing to use this certain and simple precaution against infant blindness.

MEASLES TOO PREVALENT.

Measles continues to be far too prevalent in Oklahoma. The unusually large number of cases reported proves that parents do not yet realize what a really dangerous disease measles is and how important it is to take precautions to guard against possible attacks. Not only has measles been more prevalent, but the recent epidemics have been of a virulent nature. During a single month measles was the direct cause of over fifty deaths in this state. It was a contributing cause of about half as many more. When it is considered that measles in not generally regarded as one of the typically dangerous diseases these figures are striking. The way to prevent measles is not to expose children to infection. If there is the slightest suspicion that a child has measles, it should be kept separate from other children. And it should be remembered that measles is infectious before the disease reaches the severe stage. Aside from the direct danger measles often causes permanent after effects, the most common and serious being deafness.

SPLENECTOMY

After describing the functions of the spleen as far as known and stating the presumed cause of spenic anemia, W .D. Haggard, Nashville, Tenn., (*Journal A. M. A.*, July 14, 1917), reviews the conditions in which splenectomy is indicated or has been used, other methods having been ineffective. As

regards the important question of the operation in pernicious anemia he says the best results seem to have been obtained in persons below 50 who have had the disease less than a year, in whom the blood picture is fairly good and the spleen is moderately enlarged. Mental, cerebral and spinal cord symptoms are distinct contraindications, and the presence of an aplastic bone marrow is equally forbidding. Hemolytic jaundice is the most promising of all conditions that are benefited by splenectomy and he suggests that certain cases of so-called Hanot's hypertrophic cirrhosis in young life that lasts a number of years may be really acquired hemolytic jaundice, as Mayo suggests. All chronically enlarged spleens producing symptoms should be exhaustively investigated to show why they should not be removed.

WHOLESOMENESS AND ECONOMY.

The Nation is at war. To protect our rights we must have an efficient fighting machine. The men must be given wholesome and nutritious food in sufficient quantity. The stupendous character of the conflict necessitates rigid economy of both men and material. Nothing is economy that renders food less wholesome but there is no excuse for catering to prejudice at an increased cost. We shall need all our dollars before this war is over. We must secure for our soldiers the most wholesome food at the least cost.

Our governmental departments are subject to criticism by the whole country and it would not be surprising if they catered to known prejudices in order to avoid annoying criticism. But in time of war we must be governed by scientific facts and not by prejudice. Big interests whose advantage lies in the support of a prejudice may criticise, but our leaders must be big enough to practice economy in spite of such unjust criticism. That economy will be practiced and that scientific facts and not prejudice will guide the government in the selection of wholesome foods is clearly indicated by recent actions by the Department of the Interior, the Army and the Navy. All these departments have recognized the findings of the Referee Board of Scientific Experts who found that alum baking powders were as healthful as any other baking powders. These departments have recently purchased large quantities of alum phosphate baking powders. This is the type which was furnished our soldiers on the Mexican Border and subsequently to our sailors and which proved so satisfactory. The people of the United States have recognized the wholesomeness and economy of this type of baking powder for years. Eight per cent of the baking powder used in the United States contains alum. Its wholesomeness is unquestioned. Its economy is marked. Not only are alum powders generally much stronger, so strong that the manufacturers recommend the use of only half the quantity called for by high priced baking powders, but the price of the powder pound for pound is but half as much. This means that the use of one pound of phosphate alum powder at 25 cents does the work of two pounds of the other powders costing one dollar. The saving is 75 cents. War prices would have no terrors if we could make an equal saving on all our foods by substituting something equally wholesome, twice as effective and at half the price.

SANITATION IN THE TRENCHES

The sanitary problems that have had to be specially met in the present war are taken up by C. C. McCulloch, Washington, D. C., (*Journal A. M. A.*, July 14, 1917), who remarks on the paucity of literature on these subjects. He has been informed by competent observers from the western front that the German sanitary methods and results are far behind those of the British and French and he says there seems to be some evidence that the medical department of the German army, owing probably to the use of antiquated administrative methods, practically broke down in the early part of the war. Realizing the literary lack of the medical Section of the Advisory Committee on National Defense has decided to have published as early as possible a pocket handbook designed for easy use in the field, treating of the more essential subjects both from English sources and French translations and short monographs on special subjects, written mostly by some of our own physicians who have seen service in the war. Pending this publication which will probably require several months for completion, the want can be partially filled by short journal articles on the more important subjects and this is the reason for the publication of the present paper which, however, can hardly be called a short one. He refers to the sources of his article and the works that can be consulted. The general principles as adopted behind the front are practically the same as the old established sanitary measures. The vital things in military sanitations are (1) food, (2) water, (3) conservancy, (4) personal habits, and (5) the prevention of special disease. Each of these points is taken up in more or less detail, as well as the important disease problem of the present war, such as tetanus, gas gangrene, frost bite, trench fever, gas poisoning, cerebrospinal fever, malaria, etc. He says in conclusion that the sketch is not by any means intended to cover all the the ground of military medicine and all the diseases of camps and armies, which could not well be included in a journal article. What he has hoped for is the arousing of the interest of some of our prospective young medical officers and stimulating them to further studies.

THE COUNCIL ON PHARMACY AND CHEMISTRY.

Accepted for Inclusion with New and Non-official Remedies:
Borcherdt's Malt Olive, Borcherdt's Malt Extract Co.
Lipoidine "Ciba," A. Klipstein & Co.
Pasteur Antirabic Preventive Treatment (Harris Modification), Eli Lilly & Co
Citresia, Horace North.
Hay Fever Pollenin Fall-Mulford.
Hay Fever Pollenin Spring-Mulford, H. K. Mulford Company.

NEW AND NON-OFFICIAL REMEDIES.

Kephalin-Armour.—The hemostatic phosphatid obtained from spinal cord and brain tissue of mammals. It is essentially the same as Brain Lipoid, N. N. R. For a discussion of the actions and uses see New and Non-official Remedies, 1917, p. 124, under "Fibrin Ferments and Thromboplastic Substances (Kephalin)." Kephalin-Armour is applied freely to bleeding or oozing surfaces in 1 to 2 per cent. suspensions in physiological sodium chlorid solution. Armour and Co., Chicago (*Journal A. M. A.*, June 2, 1917, p. 1625).

Thorium Nitrate.—A white substance, very soluble in water and alcohol. Soluble thorium salts resemble alum in their local astringent and irritant properties. They are not absorbed from the alimentary canal. The non-precipitant double salts of thorium are practically non-toxic, even intravenously. Thorium salts are fairly radioactive.

Thorium Sodium Citrate Solution.—Prepared by dissolving thorium nitrate, 10 gm., and sodium citrate, 15 gm., in water, neutralizing with sodium hydroxide and diluting to 100 cc. Being impervious to Roentgen rays, the solution is used to obtain cystograms of the renal pelvis and urinary bladder.

Thorium Solution for Pyelography—H. W. and D., 10 per cent.—It is the same as thorium citrate solution. Prepared by Hynson, Westcott and Dunning, Baltimore, Md.

Stronger Thorium Sodium Citrate Solution.—Prepared by dissolving thorium nitrate, 15 gm., sodium citrate, 22.5 gm., in water, neutralizing with sodium hydroxide, and diluting to 100 cc. It is used for obtaining urethral phylograms.

Thorium Solution for Pyelography—H. W. and D., 18 per cent.—It is the same as thorium citrate solution. Prepared by Hynson, Westcott and Dunning, Baltimore, Md. (*Journal A. M. A.*, June 16, 1917, p. 1817).

Betanaphthol Benzoate—Anthony-Hammond Chemical Works, Inc.—A brand of betanaphthol benzoate which complies with the N. N. R. standards for this drug. Anthony-Hammond Chemical Works, Inc., New York City.

Calcium Cacodylate.—The calcium salt of cacodylic acid containing from 43.5 to 48 per cent of arsenic in the form of cacodylic acid and free from arsenite, arsenate and monomethylarsenate. It has the mild arsenic action of cacodylates. Calcium cacodylate is white, almost odorless, and very soluble in water.

Ampuls Calcium Cacodylate Solution—Mulford.—Each ampule contains calcium cacodylate 0.045 gm. in 1 cc. The H. K. Mulford Co., Philadelphia, Pa.

Chlorazene Surgical Cream.—It contains chlorazene, 1 gm., in 100 gm. of a base composed of sodium stearate, 15 per cent, and water 85 per cent. The Abbott Laboratories, Chicago.

Borcherdt's Malt Extract with Cod Liver Oil.—A liquid composed of cod liver oil, 20 per cent., and Borcherdt's Malt Extract Plain, 80 per cent. The Borcherdt Malt Extract Co., Chicago.

Borcherdt's Malt Extract with Creosote.—100 cc. contain beechwood creosote, 4 minims per fluidounce, in Borcherdt's Malt Extract Plain. The Borcherdt Malt Extract Co., Chicago.

Borcherdt's Malt Extract with Cascara Sagrada.—100 cc. contain cascara sagrada, 60 grains per fluidounce, in Borcherdt's Malt Extract Plain. The Borcherdt Malt Extract Co., Chicago (*Journal A. M. A.*, June 23, 1917, p. 1911).

Lipoiodine-Ciba.—The ethyl ester of iodobrassidic acid containing 41 per cent of iodin. Lipoiodine-Ciba is odorless, tasteless, insoluble in water but very soluble in fatty oils. When administered, it is absorbed almost completely and excreted more slowly than inorganic iodids but more rapidly than with other iodized fats. It is said to be less likely to produce gastric irritation than ordinary iodids. It is supplied only in the form of Tablets Lipoiodine-Ciba, 0.3 gm. A. Klipstein and Company, New York (*Journal A. M. A.*, June 30, 1917, p. 1985).

PROPAGANDA FOR REFORM.

Some Misbranded Cough Remedies.—The following "cough remedies" have been declared misbranded under the U. S. Food and Drugs Act, chiefly because the curative claims made for them were found to be false and fraudulent: Barker's Remedy for Catarrh, Coughs, Colds and Rheumatism is essentially sugar and water with a small amount of cubebs, potassium iodid and creosote. Mathieu's Cough Syrup, formerly called Syrup of Tar and Cod-Liver Oil, containing little, if any, tar and no cod-liver oil, but containing alcohol, chloroform, creosote and menthol. Forrest's Juniper Tar, containing alcohol, petroleum and oil of tar. Terraline Plain, found to be simply liquid petrolatum. Tarraline with Heroin, found to be liquid petrolatum with heroin. Classe's Cough Syrup, a syrup containing alcohol, glycerin, tolu and wild cherry, and having an odor of tar. Essence Menthol-Laxene, containing alcohol, menthol, ammonium salts, chlorid, sugar, drug extract and an unidentified alkaloid. Brown's Acacian Balsam, containing alcohol, acacia, nitrate, licorice, meconic acid, tratrates, reducing sugar, sodium and potassium compounds. Sykes' Sure Cure for Catarrh, containing potassium chlorate, ammonium chlorid and small amounts of alcohol, hydrastin and methyl salicylate. Warner's White Wine of Tar Syrup, containing opium and alcohol, no tar and but an insignificant amount of wine. Rawleigh's Golden Cough Syrup, containing alcohol, chloroform, menthol, guaiacol and perhaps horehound. Rawleigh's Ru-Mex-Ol, containing 26 1-2 per cent alcohol and vegetable matter in which rhubarb was indicated. Gooch's Mexican Syrup of Wild Cherry, Tar, etc., containing morphin

and alcohol, sugar, glycerin, methyl salicylate and benzaldehyde as flavor, and small amounts of tar and cherry (*Journal A. M. A.*, June 16, 1917, p. 1863).

Flavored Epsom Salt.—When a physician prescribes a dose of Epsom Salt to be taken in one of the official aromatic waters, he does not create a new invention. Yet the U. S. Patent Office has granted a patent for the "discovery" of a method for flavoring Epsom Salt (*Journal A. M. A.*, June 23, 1917, p. 1914).

Russell Emulsion and Russell Prepared Green Bone.—The Council on Pharmacy and Chemistry reports that "The Russell Emulsion" and "The Russell Prepared Green Bone," put out by the Standard Emulsion Company, are inadmissible to New and Non-official Remedies. The Russell Emulsion is said to be composed of beef-fat, coconut, peanut and cottonseed oils, held in suspension by albumin. The mixture is called a "physiological" emulsion and is exploited on the theory that lime starvation is a main factor in tuberculosis and that large amounts of fat are required for the lime starved. There is no proof that tuberculosis is due to an insufficiency of lime in the tissues, and the claims made for the emulsion are grossly unwarranted. Particular attention is called to the exploitation of the emulsion by one Dr. Hague who talks before medical societies. The Russell Prepared Green Bone is said to be made by digesting chicken bones with hydrochloric acid and pepsin and adding glycerin at the end of the digestion. This is advertised as a lime food. The greater value of a few glasses of milk daily is not mentioned (*Journal A. M. A.*, June 23, 1917, p. 1931).

The Calcium Content of the Blood.—It has been found that the calcium content of the blood plasma of cattle is remarkably constant, even when there is a continuous withdrawal as a result of pregnancy or lactation. It has also been found that there is no marked deviation from the normal in the calcium content of the blood serum of patients in the various stages of pulmonary tuberculosis. Even when a high milk diet was furnished over long periods, the calcium content of the blood was not increased above normal. Further, it was shown that the calcium content of the blood serum of normal human adults did not differ from that in sufferers from tuberculosis. Finally, it has been found that the calcium content of blood plasma differs little from the normal in advanced cases of uremia or in hemophilia or in purpura hemorrhagica (*Journal A. M. A.*, June 23, 1917, p. 1915).

More Misbranded Nostrums.—The following "patent medicines" have been found misbranded under the U. S. Food and Drugs Act, chiefly because the curative claims made for them were unwarranted and untrue: Sterline's Asthma and Hay Fever Remedy is a water-alcohol solution containing potassium and sodium iodids, bromids and acetates, as well as some laxative substance. Sterline's Bronchial Elixir, a solution of morphine, potassium citrate and aromatics in alcohol and water. Lung-Vita, consisted essentially of a petroleum oil, saponifiable oil and a solution containing sugar and glycerin, with a small quantity of benzoic acid. Arch Brand Nerve Tonic, a compound hypo-phosphite syrup. Arch Brand Blood Remedy, containing 18 per cent alcohol, sugar, potassium iodid, sarsaparilla and emodin-bearing drugs (*Journal A. M. A.*, June 23, 1917, p. 1932).

Brom-I-Phos.—The Council on Pharmacy and Chemistry reports that Brom-I-Phos (The National Drug Co.) is not eligible for admission to New and Non-official Remedies. The label declared the preparation to contain iodin, bromin and phosphorus in an aromatic base. The A. M. A. Chemical Laboratory found that Brom-I-Phos contained no free iodin, no free bromin and no elementary phosphorus; instead it appeared to be an alcoholic preparation containing iodid, bromid and a little phosphate. The Council rejected Brom-I-Phos because the statement of composition was unsatisfactory and misleading; because the therapeutic claims were exaggerated, and because the combination of bromin, iodin and phosphorus, or of bromid, iodid and phosphate is irrational (*Journal A. M. A.*, June 30, 1917, p. 2001).

NEW BOOKS

PHYSICAL EXERCISES FOR INVALIDS AND CONVALESCENTS.

By Edward H. Ochsner, B. S., M. D., F. A. C. S., President Illinois State Charities Commission; Attending Surgeon, Augustana Hospital. Illustrated, 54 pages, flexible linen cover. Price 75c. C. V. Mosby Company, St. Louis.

This is a very convenient little volume designed primarily to meet the needs of the author in the after care of his surgical and orthopedic cases. While the matter contained may be found in larger publications, the very compactness of the arrangement, its convenience to the patient, who should have it, rather than the physician, should make it popular with those needing such instruction.

ROENTGEN TECHNIC (DIAGNOSTIC).

By Norman C. Prince, M. D., Attending Roentgenologist to the Omaha Free Dental Dispensary for Children; Associate Roentgenologist to the Douglas County Hospital, Bishop Clarkson Memorial Hospital; Swedish Immanuel Hospital; St. Joseph's Hospital and Ford Hospital, Omaha, Nebr. With 71 original illustrations, cloth, 140 pages. Price $2.00. C. V. Mosby Company, St. Louis.

The author has designed this book to meet the needs of the physician who has installed X-ray apparatus in his office along with other diagnostic means. He points out some of the commoner errors in making exposures and plates. The work is nicely illustrated, with originals and contains many hints the heeding of which will render diagnosis in this field easier.

THE MAYO CLINIC, ROCHESTER, MINN.

1916 Collected Papers of the Mayo Clinic, Rochester, Minn. Octavo of 1014 pages, 411 illustrations. Philadelphia and London: W. B. Saunders Company, 1917. Cloth $6.50 net; Half Morocco $8.50 net.

This is one of the best contributions from the celebrated Mayo Clinic yet issued. The diversity of subjects treated make it a veritable gold mine to the student. The volume is made up of papers prepared by the Staff and read before various societies throughout the country. It goes without saying that they are beautifully illustrated and arranged with the greatest skill by Mrs. Mellish, the editor, who for several years has had charge of that phase of the work at Rochester.

Much attention has been given the problems and phenomena of the internal secretions, and the treatment of goiter and cancer in its various forms, of course, is given a very important place.

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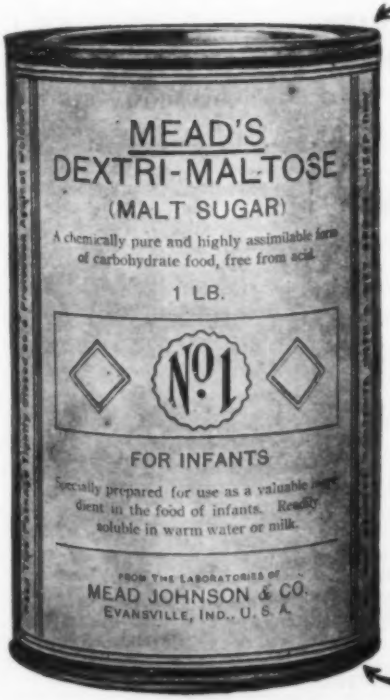
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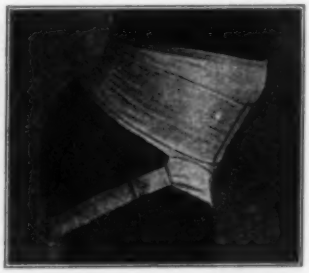

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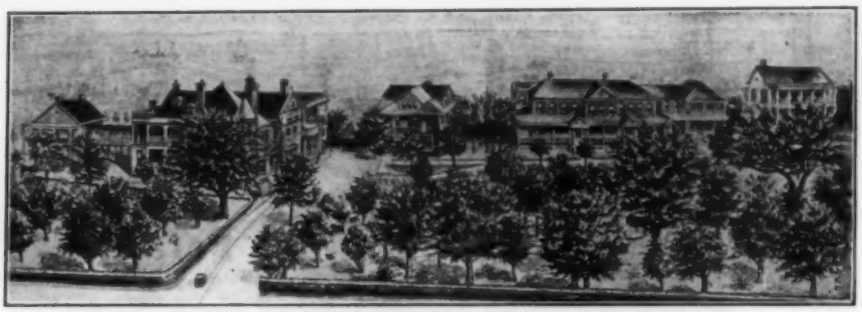

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